FINAL REPORT FOR PHASE 1
EVALUATION OF TRANSIT OPTIONS

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EXECUTIVE SUMMARY

Overview

Since 1988, the Miami-Dade Metropolitan Planning Organization (MDMPO) has been conducting a series of studies examining the possibility of connecting Miami Beach to the mainland with premium transit services. Those inquiries have generally proceeded as a regional matter: i.e., how to better connect Miami Beach with downtown Miami destinations and the larger metropolitan area. That process has reached a critical point with the completion of a Draft Environmental Impact Statement (DEIS) for a version of this regional idea, "*Bay Link*."

Meanwhile, growth in Miami Beach itself, and in the metropolitan area continues to pump more and more automobile traffic onto the Miami Beach street grid. Although the City of Miami Beach has lowered the "yield" of future development and redevelopment, there is still a potential for significant housing, hotel and office uses under the existing Comprehensive Plan and Zoning provisions. Some of this development is already under construction. More significantly, the larger region will continue to produce more trips to and from Miami Beach. If past is prologue, these trips will be by automobile.

The City of Miami approved a Locally Preferred Alternative (LPA) for the *Bay Link* corridor; and the MDMPO has requested that Miami Beach do so as well. For Miami Beach, it is now time to decide how to move forward with such a project; one that induces visitors and regional residents to use transit to access Miami Beach destinations, and one that provides enhanced transit service to Miami Beach residents, providing them with attractive transit options within Miami Beach and to destinations in Miami and the larger region.

The City of Miami Beach contracted with HDR Engineering for support in addressing these questions and in evaluating the City's options for a major improvement in transit service in the City. HDR was directed to evaluate four modes of transit in the unique context of Miami Beach:

(1) Bus Rapid Transit (also reviewed in the *Bay Link* DEIS);

(2) Light Rail Transit (also reviewed in the *Bay Link* DEIS);

(3) Streetcar; (a version of Light Rail Transit)

(4) Trolleybus.

HDR also was also tasked with reviewing the *Bay Link* Draft Environmental Impact Statement (DEIS) and other studies, as well as the City's own plans for development, major capital improvements, and other issues affecting the implementation of a project in Miami Beach. The City's standing in the regional and federal transit funding process was also addressed.

This report addresses these issues and options.

Findings

Bay Link

The options developed in the *Bay Link* DEIS, while meeting all of the technical requirements for examining a key segment of the *regional* transit system, did not fully address Miami Beach's particular *local* needs. To meet those local requirements, the project's design must:

(1) Be compatible with the character and scale of the City's built and historic environment;

(2) Enhance the streetscape and pedestrian environment, rather than overwhelm it;

(3) Provide circulation for residents, accessing community destinations as well as connecting to regional ones; and

(4) Be feasibly and economically expandable into Middle and North Miami Beach.

Current Bus Service

The 13 Miami-Dade Transit bus routes serving Miami Beach currently carry over 50,000 passengers each weekday. Nearly all of these passenger trips occur between the Beach and the mainland; approximately 45% of the bus passenger trips cross over the Bay on the MacArthur Causeway. The Metrobus services operate frequently – in some cases, peak hour headways are 12 minutes or less. The combination of this relatively high level of service and the transit dependent nature of much of its Beach ridership market have led to Metrobus' success in attracting passengers; however, the service is not capturing much of the "choice rider" market (i.e., travelers who could use a bus but also have access to an automobile). Under the People's Transportation Plan, additional bus service is planned, with the hope and intention of having all 13 routes operate at better than 15-minute schedules during peak hours; new late evening and 24-hour services will also be initiated[1]. Worsening traffic conditions will, however, produce diminishing returns in reliability for the additional service. In essence, the use of conventional bus service has reached its limits in Miami Beach.

The bus system is experiencing travel time delays that are directly related to the high levels of congestion that are present on the roadways buses use and the lack of any preferential treatment provided to buses that are present in most urban transit systems (e.g., bus signal pre-emption, bus queue jumper lanes, exclusive bus only lanes, etc). The Bay Link project would provide a dedicated transit treatment along the Causeways – that would lead to travel times that are competitive with the automobile – but in order to access that conduit, the transit vehicles…bus or rail…must be able to maintain their schedules, or "headways", in the busy, urban environment of Miami Beach.

In addition to Metrobus service to the Beach, the Miami Beach funded Electrowave electric bus circulator service operates on two loops between South Pointe and the Convention Center, and serves approximately 1,900 passengers/day. This service is limited to the east side of the Beach

[1] These increased headways would add a total of 188 daily new bus trips through Miami Beach (76 new bus trips during peak hours, and 112 bus trips during off-peak hours).

(i.e., Washington Avenue), and while it contributes to Beach mobility and is well supported by the hospitality industry, Electrowave is not a significant provider of transportation for Beach residents.

Regional and Federal Funding Picture

Should Miami Beach adopt the LPA, the project is likely to be given high priority by the Miami-Dade Metropolitan Planning Organization. It will then be carried forward into the Final Environmental Impact Statement process and, with federal approval at each stage, into Preliminary Engineering, Final Design, and a federal funding commitment for part of the construction cost. Although the specifics of future federal participation in transit projects are now being debated in Congress, it is likely that this process will remain substantially the same as today. The current authorizing legislation will sunset on September 30th of this year.

Because of the City's relatively high transit use, its land use patterns and population density characteristics, this project will perform well in the ratings process used by the Federal Transit Administration (FTA) to evaluate and recommend transit projects.

There are funds programmed and available in both the regional funds approved in the People's Transportation Plan and in state funding for transit capital projects that will be sufficient to cover the local share needed to match federal funding. Likewise, non-FTA federal funds are also available as a match.

Adopting a Locally Preferred Alternative prior to September 30th of this year will place this project, and the City of Miami Beach, in a much stronger position in the transit funding process than if the City were to delay its decision beyond that date. Although there are funds currently programmed into the regional transit funding effort managed by Miami-Dade County's Office of Public Transportation Management, failure to approve a Locally Preferred Alternative for a transit project connecting Miami Beach with mainland destinations will open the possibility that the Miami-Dade MPO and the OPTM will shift their attention to other project opportunities in the region and, in effect, leave this project behind. Similarly, the state and regional requests for inclusion in the upcoming reauthorization of the federal transportation bill now include this project. Failure to approve an LPA - and thus "stay in the game" for Federal Transit Administration approval of later stages of project development - will make it less likely that the ultimate authorizing bill will include the project.

Concern has been expressed in Miami Beach that adopting a Locally Preferred Alternative will irrevocably commit Miami Beach to construction of the project, or that other units of government, with or without this action by the Miami Beach City Commission, could proceed with the project while ignoring local objections, or failing to meet conditions required by the City. This is not the case. At any point in the process subsequent to adoption of the LPA, and prior to approval of a Full Funding Grant Agreement (FFGA) by the Federal Transit Administration the City of Miami Beach could formally withdraw its support for the project, and its legal, contractual and political foundation would be removed. A long list of implementing actions will require the City's involvement and approval in the design and construction of the project. Thirdly, the FTA will

require land use conformity actions in support of the project, and this authority generally lies with local jurisdictions.

In the highly competitive arena of federal transit funding, there is no realistic prospect that other agencies, using federal funds for a portion of a project's cost, could proceed to build and operate a transit project in Miami Beach over the City's objections.

Miami Beach's best defense against a project it does not want is, of course, to identify and advocate for a project that it *does* want, one that enhances the quality of life in Miami Beach and provides a popular transportation choice for its residents.

Choosing the Best Rapid Transit Option for Miami Beach

The four transit modes were evaluated against a set of criteria which incorporate key community benefits – positive effects to be maximized – and key community concerns – negative effects to be minimized. The results of that scoring process are summarized in Table ES-1.

Table ES-1 - Transit Technologies: Meeting Project Goals

	Light Rail Transit (LRT)	Bus Rapid Transit (BRT)	Streetcar	Electric Trolleybus	Standard (MDTA) Bus
Compatible with Character and Scale of Miami Beach?	◐	◐	●	◐	◐
Would Enhance Streetscape and Pedestrian Environment?	●	◐	●	◐	◐
Would Provide Local and Regional Circulation for Residents?	●	●	●	◐	◐
Would be Economically and Physically Feasible to Extend to Middle and North Beach?	◐	●	●	●	●
Would not Result in Significant Construction Disruption?	○	◐	◐	◐	●
Is the Mode Compatible with the Regional Transit System?	●	●	●	○	●
Is the Mode Eligible for FTA Funding?	●	●	●	◐	●
Does the Mode Provide a High Level of Passenger Comfort?	●	○	●	○	○
Composite Score	**20**	**19**	**23**	**15**	**19**

● = Yes (3 points) ◐ = Moderate (2 points) ○ = No (1 point)

The "No Build" Alternative

During this Evaluation, some participants have opined that the preferred alternative for the City of Miami Beach should be the "No Build" alternative.

The trends described in this report indicate that the "No Build" alternative is neither a prescription for keeping Miami Beach "as is" nor an effective mobility strategy. Given the population and demographic trends in Miami Beach and the region…and twenty lanes of automobile access to Miami Beach…there is no prescription that maintains the status quo. The community will change under this pressure; the question is whether it will change to resemble a smaller, tropical San Francisco or Seattle. These cities differ in the range of transportation options available in two geographically constrained, physically beautiful, largely built-out cities. In San Francisco's case, a diversity of transportation choices has made a popular place more urbane and livable for residents and millions of visitors each year. Seattle, although still enjoying a positive image with most Americans, has become increasingly choked with traffic…a lovely city losing some of its quality of life. In Seattle, the lack of transportation choices has led to disinvestment and severe traffic congestion; after twenty years of indecision, one of the nation's most ambitious transit construction efforts is now just getting underway.

Recommendations

Washington Avenue with Streetcar Transit

Based on this Evaluation, the City of Miami Beach is advised to adopt Streetcar Transit as its Locally Preferred Alternative. The Streetcar should be designed to operate on two distinct alignments serving the Miami Beach portion of the study area. One route provides local

Figure ES-1

Recommended Route

circulation within Miami Beach, and the other route connects Miami Beach to downtown Miami via the MacArthur Causeway. These alignments are shown in Figure ES-1.

The Streetcar is, among the various modes available, the best "fit" with the environment and character of Miami Beach. It is a mode of transit found in a small, but growing number of communities in the U.S., but is widely used in Europe. Cities from Munich to Amsterdam to Strasbourg to Prague rely on in-street-running trams as a key component of their transportation systems and as a part of a quality of life found in only a few American cities. The scale of the vehicles, and the location of the track - flush in the street surface of a shared travel lane - make it possible to add the ingredient of high-capacity transit to an already very lively streetscape without overwhelming the character of the community or radically changing street design. Several key characteristics of Streetcars support this choice of options and address important community concerns in Miami Beach:

- The trackway and overhead catenary system can be constructed in a process that is swift and has minimal impacts on surrounding properties and on use of the streets.
- Electric propulsion means the vehicles will be clean and quiet, essential characteristics in a busy, livable city.
- Landscaping such as the median on Washington Avenue can be retained, and even improved.
- In-street operations mean no loss of travel lanes and minimal loss of on-street parking.
- Station stops are simple and compact, fitting well into the lively South Beach streetscape.
- Ability to successfully use this option northward into Middle and North Beach.

Rail transit, both Streetcar and Light Rail, has demonstrated positive economic effects in property values, commercial leasing and retail sales. While in the past, adjacency to heavy rail transit lines has had little measurable positive impact, and downtowns have withered even when served by heavy rail systems, Light Rail and Streetcar projects are producing striking economic benefits to the districts and individual properties they serve:

- Portland's Streetcar line has sparked $1billion of transit-oriented development in five years, and property values for existing buildings in the corridor are increasing 40 % faster than similar property outside of the corridor.
- In Alameda County, for every meter a residence is located closer to the nearest BART station, its sales price was shown to increase by $2.29, all else being equal.
- In Dallas, the opening of the DART light rail line sparked a real estate renaissance, with a premium being paid for property along the line. "Many investors have come to look at proximity to the DART light rail stop as offering a competitive advantage for their properties," said Jeff Stone, senior managing director of Holliday Fenoglio Fowler LP.

These cities and others have realized the benefits of connection: in an era when capital and talent are mobile, quality of life is the most durable economic strategy. A livable, sustainable community…a world class city…needs to provide world class transportation.

For this project to succeed from Miami Beach's perspective, the new transit service must attract large numbers of riders who do not now use transit. Streetcars and Light Rail Transit, in

particular, have demonstrated the ability to attract these riders. While one can argue that prosperous, middle-and upper-income Americans should ride transit, by and large they do not. Americans *do* ride rail transit, streetcars in particular. Some of the reasons for this success are rational and measurable: the reliability of rail transit (adherence to schedule and few vehicle breakdowns), quality (smooth ride, climate control, attractive interiors), and "user-friendliness" (the ease of figuring out routes and destinations which a fixed rail route affords). Some of the reasons for this behavior are not quantifiable, even emotional…the reasons have to do with image and perception…some of the same reasons why Miami Beach is such a popular place today.

Other Transit Modes

Light Rail Transit

Bus Rapid Transit

Electric Trolleybus

"Trolley-Type" Diesel Bus

Three of the four transit modes examined are, for different reasons, less attractive choices for the City of Miami Beach.

Light Rail Transit – Conventional light rail, as envisioned in the *Bay Link* Draft Environmental Impact Statement, and as approved by the City of Miami, is out of scale with the character and context of Miami Beach's built environment and development objectives. Construction of a dedicated trackway in the confines of Washington Avenue and other lively City streets would be highly disruptive. Expansion of the alignment into Middle and North Beach would be very difficult, given that such a project would appear to rate poorly against the federal criteria for a subsequent New Starts application, and would likely be too expensive to be feasible as a locally-funded project or as a project funded under the proposed "Small Starts" program.

Bus Rapid Transit – Construction of a separated busway or traffic management changes could move buses more quickly through the most urban portions of Miami Beach, and these vehicles could continue into Middle and North Beach. A key benefit of this project, attracting "choice riders" would, however, be jeopardized due to the uncertain ability of BRT to attract these riders. BRT vehicles carry smaller passenger volumes per vehicle than the rail options being considered; their ability to meet initial and future demand is thus somewhat hampered.

Bus Rapid Transit, while often an effective choice as a "suburban commuter-mover," has a number of characteristics that make it less desirable as an "urban circulator," a key function of this project from Miami Beach's point of view. Even though the latest diesel or diesel-electric hybrid bus vehicles have reduced noise and emissions compared to traditional buses, this mode would be somewhat hostile to the pedestrian-friendly environment of Miami Beach. The vehicles' operating characteristics – slower acceleration and a less smooth ride than rail vehicles, makes frequent stops less practical.

While BRT is an improvement on traditional bus design, there is also no evidence that proximity to bus service provides any economic "lift" to the streets or districts along the bus line.

Trolleybus – Participants in this study appeared to refer to two different definitions of "trolleybus."

> Electric Trolleybus would share some of the traits of Bus Rapid Transit, both positive (easy extension to northerly portions of the City) and negative (smaller passenger capacity per vehicle). Use of electric propulsion would eliminate some of the most significant negative traits of buses. The overhead catenary system would, however, be more elaborate (two wires are needed to power electric trolleybuses versus one for LRT or Streetcar), and therefore more visually intrusive.
>
> "Trolley-style" Diesel Buses, while used in many communities as tourist shuttles, lack the carrying capacity needed for this corridor. This type of bus service is not eligible for federal New Starts funding.

Frequently Asked Questions

Over the course of this *Evaluation of Rapid Transit Options for Miami Beach* project, several presentations were made and workshops held with the City Commission, City advisory boards/committees, and the general public. A series of questions were repeated at most of these meetings, which are presented below, along with the responses the technical team provided to those questions.

1. Can a LRT, BRT, Streetcar or Electric Trolley system be built without removing a traffic lane or a parking lane?

   Given adequate street space ("right-of-way"), each of these systems could be constructed without removing any traffic or parking lanes. Even in dense, urban areas such as South Beach, these vehicles can (and do) operate in mixed traffic (i.e., with automobiles, trucks, buses, and bicycles sharing the same lane). Most systems also preserve parking lanes except where a station platform might extend from the sidewalk within the parking lane; which would result in the loss of between 3 and 5 on-street parking spaces/station area.

2. Would many residents of Miami Beach use a rapid transit option?

   At present, there are 50,000 trips per day on buses in Miami Beach. While many of those trips are by non-residents (who would use a car if there were no bus service to and from the Beach), according to the 2000 Census, over 11% of all Miami Beach households use the bus for work trips every day. In addition, the Beach bus service aides residents who shop at the supermarket, attend the High School, cultural events, and participate in local civic matters.

   Many Beach residents appear to believe that additional transit service would be a positive improvement. Over 70% of them voted in favor of the ½ cent sales tax increase initiative.

3. Wouldn't a rapid transit system adversely impact our unique character?

   The character of Miami Beach is indeed unique. The alternative alignments, including the recommended alignment, are located in or adjacent to seven different historic districts that are regulated to protect the City's character. Although any major public investment could potentially cause harm, the intent of a rapid transit project should be to produce quite the opposite impact. With the introduction of a new fixed transit system, the City can systematically improve the streetscape to enhance the quality and long-term economic viability of the City's architectural legacy. For instance, the existing cobra-head light fixtures could be replaced with architecturally compatible fixtures; the overhead catenary supports would also be compatible.

   With regard to the different modes, LRT vehicles may be out of scale with the pedestrian orientation of South Beach. That is, the typical two-car trainset is nearly 200 feet long, meaning that they would fill a large portion of the block while picking up and discharging passengers at stations. Streetcars, BRT and Electric Trolleybuses are much shorter in length (streetcars are typically 66.0'-80.0', and BRT buses and Trolleybuses are generally around 30.0' to 40.0', though they can be extended through articulation), and they are shorter in height and width

than LRTs (Streetcars, BRT and Trolleybuses are generally a foot shorter and a foot narrower than LRTs).

4. Wouldn't businesses be impacted by construction of a rapid transit system?

   Construction impact can be minimized, and concentrated to a few streets at any one time. Once the crews are done, they move on to the next segment. The construction period would be longest for LRT systems, which need to dig between 18" and 30" to build the appropriate foundation for their operations. The track bed for Streetcar systems is very shallow (under 12 inches), which doesn't require the lengthy and costly process of relocating utilities. BRT and Trolleybus systems would disrupt businesses less so, as their associated construction are limited to a dedicated lane protected by a raised curb and traffic controls for BRT, and installation of overhead power systems for Trolleybuses.

5. The overhead catenary wire is a visual impediment. Why is it necessary for LRT, Streetcars, and Trolleybuses? Would they be dangerous (i.e., could they snap) during a hurricane?

   The overhead catenary systems provide the electrical power which drive these vehicles. They are less obtrusive visually than they might appear to someone who's never seen them. Unlike the old trolley systems, which had webs of wires overhead, these systems rely on either a single thin wire (i.e., with LRT and Streetcar systems) or a wire couplet (for Electric Trolleybuses) that's usually partially hidden by trees, the outline of buildings, and other urban features. In places with LRTs and Streetcars that experience hurricanes (e.g., Houston, Tampa, San Juan), there has not been an incident where live catenary wires have injured anyone during high winds. The protocol is to turn the power systems off when winds reach sustained gusts of 50 mph, and the poles holding the wires in place withstand hurricane winds of 110 mph, nearly twice the design standard for most light poles, telephone poles, street poles, etc.

6. Why do we need to make a decision now? Can we delay our decision until we have more information?

   Delaying this decision is not in Miami Beach's interest. If a mode and alignment choice that is favorable to Miami Beach can be selected, then the sooner Miami Beach "weighs in" with this recommendation, the more likely it is that the project will be funded and built, given the dynamics of regional and federal transit funding. If, upon further refinement of the proposed project in the next stages of the project development process, Miami Beach concludes that implementation is not in the community's interest, then there are ample opportunities to withdraw Miami Beach's support and discontinue project development.

7. The Bay Link project would only serve people from Miami?

At this time, the technical team does not have numerical data to distinguish how many passengers that would use the system would be Beach residents, Beach employees, visitors, tourists, etc. Many of the 50,000 daily bus passengers using MDTA buses on the Beach (whether they're from the Beach or elsewhere), would divert to a rapid transit system, and the system could be an important form of mobility for the new Beach residents expected to come as more Beach properties develop, and would provide an option to travelers from the mainland who would otherwise have little incentive not to use an automobile to access the Beach. The recommended project design provides Miami Beach residents with access to an increasing number of destinations in Miami (such as the new performing arts center), while also providing enhanced circulation among Miami Beach destinations.

8. What can the federal money be used for?

   All four modes being examined – LRT, BRT, Streetcar and Electric Trolleybuses – can be constructed with federal funding. A rubber-tired bus that resembles a vintage trolley (such as the vehicle in use in Coral Gables) would not be a candidate for federal funds.

9. The selection of the Consultant Team was flawed and the Consultant Team has a strong bias toward transit.

   The HDR Team responded to a public solicitation for bids from consulting firms and was short-listed for an interview. We were recommended for selection by a selection panel of citizens and City staff. Another interview was conducted of the three short-listed firms with the City Commission, which unanimously approved the HDR Team for selection. Prior to this project, HDR had never been under contract for consulting services with the City of Miami Beach.

   HDR is a full service architectural, planning and engineering firm involved in transportation, water and environmental systems, buildings, and other infrastructure. With regard to our transportation practice, we provide support to clients in all modes – with our largest area of work in roadways and bridges.

   HDR has had no contract with any of the organizations sponsoring the Bay Link transit project. HDR is also not involved with any manufacturers of transit vehicle equipment or facilities and has no economic interest in the outcome of this decision by the Miami Beach City Commission.

Comparative View of Transit Modes In Operation In Miami Beach

Alton Road at Lincoln Road

Current Condition- Long View

Bus Rapid Transit- Long View

Bus Rapid Transit- Close Up

Light Rail with Trackway - Long View

Light Rail with Trackway - Close Up

Streetcar in Right Travel Lane – Long View

Streetcar in Right Travel Lane – Close Up

Views of Streetcar Transit in Operation In Miami Beach

Washington Avenue at 5th Street

Right Travel Lane on 17th Street

Washington Avenue at 6th Street

SECTION ONE -- INTRODUCTION

Miami Beach is a unique community of great character, beauty and livability. The first line of the City's Mission Statement is not hyperbole: Miami Beach ***is*** a world-class City.

On one hand, it contains dense and lively urban districts with a hospitable pedestrian environment. Residential areas adjacent to these commercial and mixed-use areas range from dense, high-rise residential corridors to quiet single-family streets. It is a major international visitor destination, with matchless beaches, stunning architecture, and a fashionable flair. The combination of these ingredients provides Miami Beach with urbanity not found in most American cities of its size…or even much larger.

This livability makes Miami Beach a very attractive place to live, and a rapidly changing mixture of people live there. The city is getting younger, more urban, and in transportation terms, more "multi-modal" in its transportation preferences. Given these changing demographic characteristics, and continuing growth in international visitors, a world-class transit system will respond directly to an increasing demand for non-automobile options. Such a system may even become a requirement for these new expectations.

On the other hand, Miami Beach is now served by a transportation system that is not world class at all. It is connected to the Florida mainland by twenty lanes of State and County roadways. The extensive regional bus transit system is now operating nearly at the limits of its capacity, given the traffic conditions in the City. The current transit system mainly serves the transit-dependent: lower-wage workers, lower-income retirees, and other "non-choice" riders. Transit is not relevant to most middle- and upper-income Beach residents and visitors. Like many American cities, but unlike the international cities in its class, Miami Beach's transportation system is very automobile-dependent and dominant.

1.1 Project Objective

With the passage of the People's Transportation Plan and the completion of the *Bay Link* DEIS, Miami Beach is being offered the opportunity to make a major investment in transit, one that could be of a quality and reliability that would attract "choice riders". The question is: Can that investment be made in a way that fits the unique environment of Miami Beach?

This report is intended to provide the Miami Beach City Commission with information and analysis to aid in answering that question.

1.2 Scope of Work

The Scope of Work for this evaluation included the following elements:

1. Explain the significance of rapid transit to Miami Beach in addressing growth and traffic congestion issues in light of known and imminent development in the community.

2. Review and comment on study accuracy and completeness of the *Bay Link* Draft Environmental Impact Study (DEIS) dated October 2002.

3. Study and contrast, in generic terms and also specifically to the conditions of Miami Beach the advantages and disadvantages of the following system modes (technology): Bus, Bus Rapid Transit (BRT) and Light Rail Transit (LRT) or other variations (i.e. Trackless Trolley, etc.). Develop data beyond the DEIS, if necessary, to support a full explanation of the different transit modes. Examine route options including, but not limited to, those addressed in the DEIS. Comparison should include the effectiveness of each transit mode and their projected passenger capture rates within Miami Beach; consultant will rely on data supplied by the City and on the data and analysis produced for the DEIS, rather than creating new data or models. Summarize order-of-magnitude cost for bus, BRT, LRT, and other options; including necessary infrastructure and other similar factors to enable the Commission to have a full understanding of the practical transit modes available.

4. Assess the capacity and reliability of the current bus transit system, including the Electrowave shuttle, as the baseline for transit system enhancements.

5. Evaluate the long-term impact on land use and infrastructure of bus, BRT, LRT and other options.

6. Evaluate the potential for each mode to be expanded through subsequent phases.

7. Evaluate how a bus, BRT, LRT, or other options fit into the regional transportation system.

8. Carry out a public involvement effort for this study which includes:
    - Two public workshops.
    - Meetings will be held with each of the City committees which are stakeholders in the design of this transit project:
        (a) Planning Board
        (b) Historic Preservation Board
        (c) Traffic and Parking Committee
        (d) Meetings with City Commissioners, Directors of Public Works, Planning, CIP, the MD MPO, OPTM, MDT, as well as County Commissioner Barreiro.

9. Based on the findings of elements 1-7 above, provide proposed conditions to be considered for adoption by the Commission, which would attach to approval of a Locally Preferred Alternative to guide Final Environmental Impact Statement (FEIS) preparation, project design, and implementation.

10. Provide a definitive description as to how the local and federal transit project funding process works. Explain the consequences in project funding and priority of prompt action to proceed with a Final Environmental Impact Statement (FEIS) versus the approach of continuing to review and discuss over the next years, and then proceeding with a FEIS. Include in the analysis a summary as to the impact of federal funding based on the technology (mode) chosen as the LPA.

11. Complete and provide the above tasks in twenty printed copies and one unbound, camera-ready copy of a written document, inclusive of text, drawings, graphic charts, etc.

12. Present findings and recommendations at public meetings and to the Miami Beach City Commission no later than July 10, 2003.

SECTION TWO – BACKGROUND INFORMATION

2.1 Context

The notion of a high-quality transit connection between Miami Beach and downtown Miami has a long history. The issues and possibilities have been studied in several stages since the late 1980's:

1988 Miami Beach Light Rail Transit Feasibility Study – examined the feasibility of constructing a light rail line from Downtown Miami to Miami Beach via the MacArthur Causeway. The study proposed an 8.6-mile line from the Bayside/Omni area to the Miami Beach Convention Center, and then northward to 63rd Street.

1993 Dade County Transit Corridor Transitional Analysis – developed a 9.3-mile LRT alternative for the Miami Beach/Miami connection. The proposed line ran from the Overtown Metrorail Station along the FEC rail line to Biscayne Boulevard, then across the MacArthur Causeway to 5th Street, where it turned northward on Washington Avenue, past the Convention Center and ultimately on to 71st Street. The section between the Convention Center and 71st Street was considered a future phase.

1995 East-West Multimodal Corridor Study – this Major Investment Study, portions of which are still being updated, investigated the transportation options for serving a corridor running from Florida International University's main campus in western Dade County, along the length of SR 836, through the future Miami Intermodal Center to downtown Miami and the Port of Miami. Included in the overall concept is a separate LRT corridor from downtown Miami to Miami Beach. The LRT portion of the project extended from Flagler Street along Biscayne Boulevard and across the MacArthur Causeway to 5th Street and then north on Washington Avenue to the Convention Center.

2001 Miami-Miami Beach Transportation Corridor Study (Bay Link) - an outgrowth of the larger East-West corridor study, the Bay Link study examined a variety of transit modes and routes for connecting these two urban centers.

Bay Link Draft Environmental Impact Statement, 2002 – focused analysis and comprehensive environment evaluation of the Bay Link corridor (Downtown Miami across the MacArthur Causeway with three circulation alternatives within Miami Beach) under several modal and routing alternatives. The Preferred Alternative recommended by the study is an LRT system using a route on both Alton and Washington avenues between 5th Street and the Convention Center.

2.2 Setting and Environment

2.2.1 Land Use

Miami Beach is diverse demographically, compact in its form, rich in historic and architectural resources, and it is characterized by a dense, fully utilized urban fabric. The City of Miami Beach has completed a revision of its Future Land Use Map and Zoning Ordinance both of which updated policies toward future development and preservation of existing densities.

For example, as a result of the changes in the Future Land Use and Zoning Maps, development patterns and densities have been well defined. High intensity residential uses are allowed on the Biscayne Bay waterfront and in the South Pointe area, as well as along the oceanfront. These high intensity areas can develop to a maximum of sixteen (16) stories in height. Within the Ocean Drive/Collins Avenue Historic District, height is limited to five (5) stories. Further inland, in the Flamingo Park Historic District, height is limited to four (4) stories, thus massing higher profiles on the east and west sides of the City below Lincoln Road, and lower profiles within the interior areas of the City. The South Pointe district allows for mixed-use development; e.g., characterized by high-rise residential on the waterfront coupled with town homes and retail on the street side, as shown here.

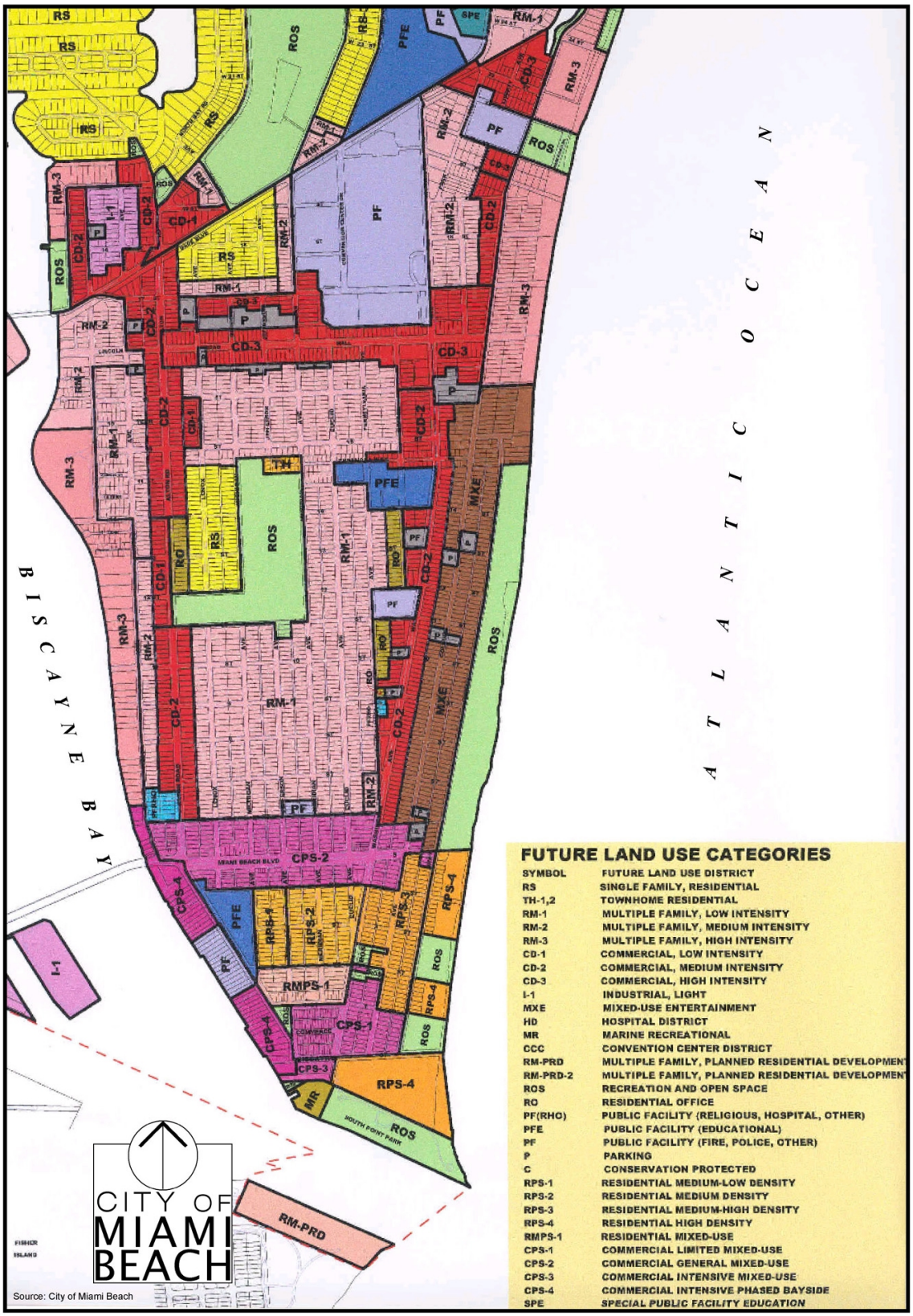
New Mixed-Use Development in the South Pointe District

Assuming a reasonably complete build-out of the plan now in place, additional travel demand will be created from new residential, commercial, office and other allowable development.

These characteristics and requirements are very supportive of, and complementary with, rapid transit systems (see Figure 1). That is, rapid transit systems are often synonymous with dense urban settings in that they provide the mobility required by the large populations inhabiting them, and contribute to the diversity and mobility options available within international cities.

Figure 1

FUTURE LAND USE



2.2.2 Cultural Resources

Of the City of Miami Beach's 10 historic districts shown in Figure 2, seven of which are located south of 18th Street, preserve the City's renowned architectural past and character. The City's Historic Preservation Board reviews requests for use of the public rights-of-way, landscape, and the buildings in any and all of the historic districts and sites. Before a permit is issued, the application for improvement needs to include a Certificate of Appropriateness from the Historic Preservation Board.

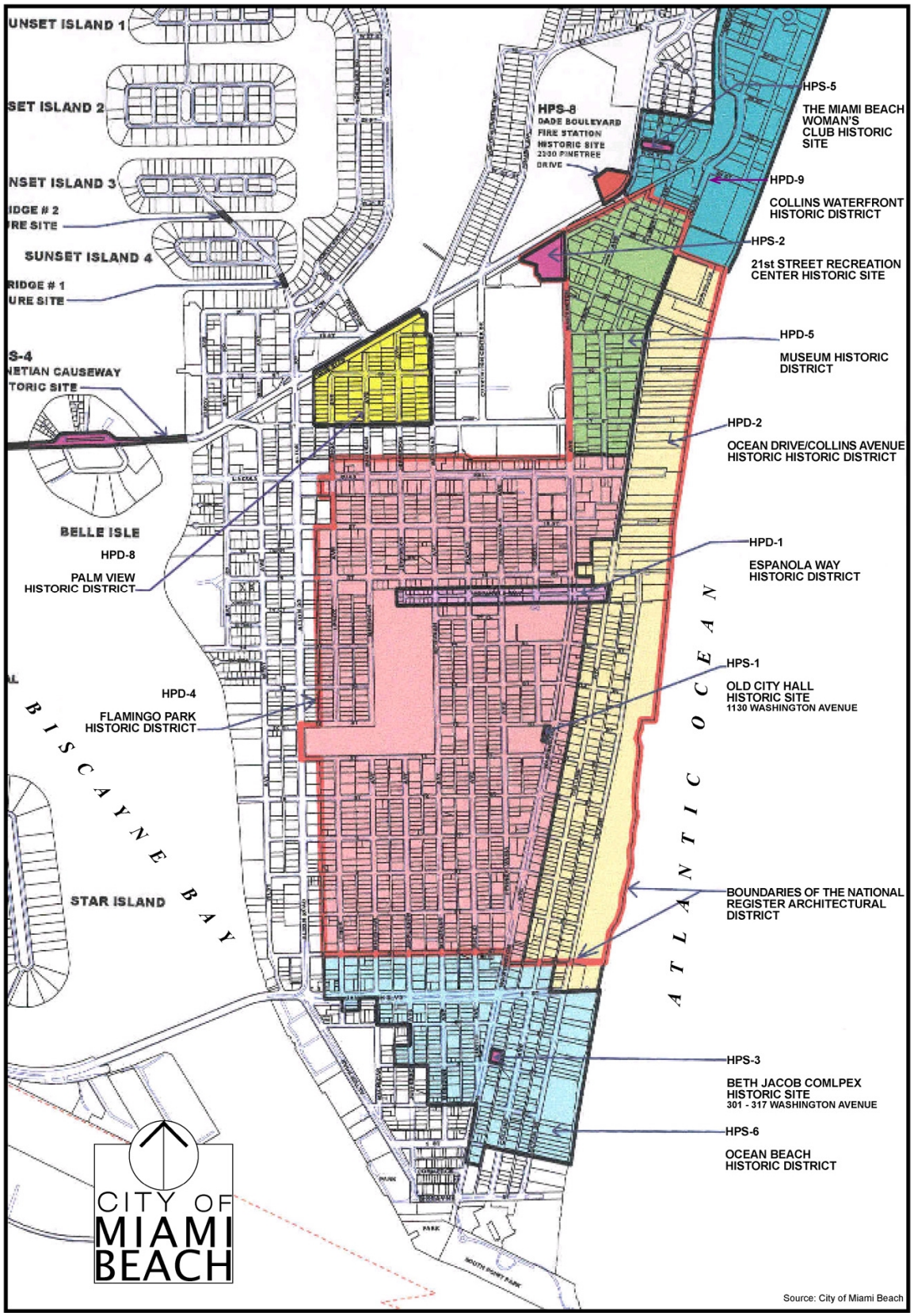
With regard to the introduction of a rapid transit service in these historic districts, the impact to cultural resources from transit should be less than effects from continued increases in automobile traffic. In fact, many of the buildings and facilities within the historic districts were built when streetcars served those same streets; and in that regard, may be thought of as complementary additions to the public right-of-way.

January, 1930, Looking North on Washington Avenue from Biscayne Street

Moreover, the City has plans for the improvement of streetscape and landscape in some parts of the study area, most notably the South Pointe district and Washington Avenue. The introduction of a transit system can catalyze and accelerate improvements in the affected areas. In other areas, such as the Washington Avenue corridor, south of Fifth Avenue, the improvements should remain since they are already part of the current improvement plan, and the transit system should accommodate them.

Figure 2

HISTORIC DISTRICTS



2.2.3 Land Use Analysis of Potential Transit Streets

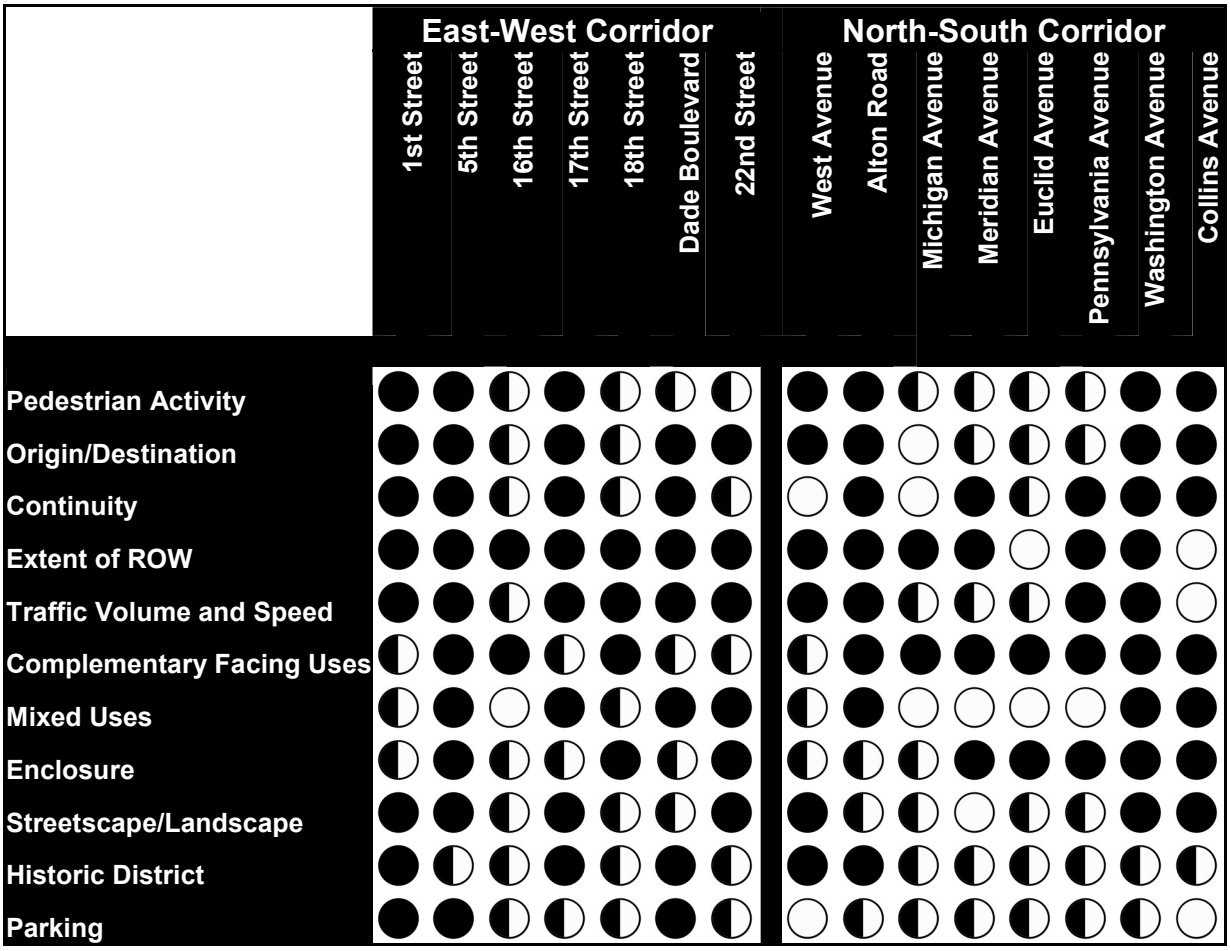
An examination was made of fifteen streets that by their classification, size and location were considered to be "candidates" for the location of a transit project. These streets were then analyzed to consider how they might accommodate a transit system from a land use and urban design perspective. The sample streets are divided into two groups: east-west corridors and north-south corridors. They were analyzed against 11 criteria to determine how well suited they were for transit, regardless of the system's technology.

The criteria for a good transit street adopted by the study team are as follows:

- *Pedestrian Activity:* A transit street supports and encourages pedestrian activity. Transit users access the system through the pedestrian network.
- *Origin/Destination:* A transit street accommodates either trip origins (e.g., in residential districts) and trip destinations (e.g., an employment center); or both (e.g., the Collins Avenue/Ocean Drive district is an illustration of a combined origin and destination area).
- *Continuity:* A transit street needs to provide a direct and continuous connection to the rest of the system.
- *Extent of Right-of-Way:* A transit street needs to accommodate the transit service without compromising the street character.
- *Traffic Volume and Speed:* A transit street can accommodate other transportation modes that are compatible with the characteristics of the street.
- *Complementary Facing Uses:* Buildings along a transit street provide direct access to the transit service and contain ridership-generating uses.
- *Mixed Uses.* Transit streets operate best in mixed use, high-density areas, such as accessible retail or civic uses at the ground level, and other uses above.
- *Enclosure:* A transit street space is defined by the structures on either side, preferably with significant architectural interest and merit.
- *Streetscape/Landscape:* A transit street is well developed to suit the needs of its users. It provides shade and rain protection, places to sit, trash receptacles, pay phones, information kiosks, and other amenities. A transit shelter or stop should fit architecturally into the streetscape character.
- *Historic District:* These districts often accommodate transit services, which can reinforce the character of the historic district through design of station areas and transit vehicles.
- *Parking:* While the most successful transit streets are the ones that limit the street space used for parking, it is beneficial to have on- and off- street parking adjacent to transit streets to make up for the spaces that may be lost to accommodate the transit service.

These criteria were used to evaluate the advantages and disadvantages of certain streets for transit service, which is displayed in Table 1.

Table 1
Analysis of Potential Transit Streets



Key
● **Allows for Transit Development**
◐ **Existing Concerns and Solutions Needed**
○ **Impediment for Transit Development**

2.3 Trends

2.3.1 Population

Despite the City's slight recent decline in residential population, the number of residents aged 18-64 (i.e., peak driving ages) has increased by over 50% since 1980; and the median age of residents has decreased from 65.8 years of age to 39.0 years of age, as presented in Table 2. While data on per capita vehicle miles of travel, vehicle registrations, or driver's licenses by Beach residents was not available for this report, the concentration of residents of driver's age is one explanation for increasing traffic congestion on City streets.

Table 2 - Miami Beach Population Changes, 1980-2000

	1980	1990	2000
Population	96,298	92,639	87,933
Age Cohorts			
0-17 years old	8.9%	14.2%	15.0%
18-44 years old	18.9%	36.2%	44.0%
45-64 years old	20.5%	19.3%	21.0%
+65 years old	51.8%	30.3%	19.0%
Median Age	65.8 yrs	44.7 yrs	39.0 yrs

Source: *US Bureau of the Census, 2000, 1990, 1980*

In addition, the impressive growth in commercial activity and tourism over the past twenty years has contributed to traffic volume increases, as well as declining availability of both on- and off- street parking.

2.3.2 Traffic Volume

As many Beach residents know, during the past decade traffic volume has grown significantly. Table 3 illustrates the dramatic increase in daily traffic along the City's main arteries.

Table 3 - Miami Beach Average Daily Traffic Volume Changes, 1990-2000

	1990	2002	% Change
Julia Tuttle Causeway	63,475	88,000	+38%
Alton, 20th-21st	26,489	44,000	+66%
Collins, 5th-6th	13,402	17,000	+27
Collins, 20th-21st	18,298	31,500	+72%
MacArthur Causeway	62,000*	86,000	+39%
79th Street Causeway	10,829	18,600	+72%
	1990	**2002**	**% Change**

Source: *Historical AADT (Average Annual Daily Traffic) Report,* FDOT Transportation Statistics Office, provided 7/1/03

* 1994 records**;** 1990 counts not available**.**

According to the Miami-Dade MPO travel demand forecast model, traffic volume will generally continue the upward trend of the past ten years. The rates of growth are lower than they've been, in large part, due to the shrinking available capacity on local streets (and corresponding decrease in travel speeds), which limits the number of vehicles that can travel on the local streets examined. These projections are shown in Table 4.

Table 4 - Miami Beach Projected Average Daily Traffic Volumes, 2000-2025

	2000*	2025	% Change
MacArthur Causeway	66,166	74,379	+12%
Alton, 41st-23rd	28,833	37,623	+30%
Alton, 15th-5th	33,111	36,527	+10%
Collins, 5th-15th	17,557	22,170	+26%
Collins, 15th-23rd	16,956	15,238	(10%)
Collins, north of 41st	16,064	19,989	+24%
23rd Street	6,425	9,540	+48%
15th Street	5,521	7,767	+41%

Source: *Bay Link DEIS*, October 2002

* Several of the Year 2000 traffic count volumes in Table 3 differ from the 2002 traffic counts shown in Table 2 which are from the FDOT Historical AADT Report. An explanation for this is that either the MPO model is using a lower baseline traffic volume, or that the locations where traffic counts were taken for the MPO model and the FDOT database differ. Whichever agency's traffic counts are used, they both indicate very significant rates of increase in traffic volume.

2.3.3 Parking

In addition to decreasing available roadway capacity, the City's on- and off- street parking capacity is also dwindling and, in some locations, is over utilized, as shown in Table 5. Except for the West Avenue corridor, parking demand is currently unmet below 41st Street, and availability is projected to become much more restricted in the next 5 to 10 years.

Table 5 - Miami Beach Projected Parking Availability, 2003, 2008, 2013

Districts[1]	2003	2008	2013
South Pointe	(69)	(608)	(795)
Ocean Drive	(1,254)	(3,369)	(4,321)
West Avenue	232	657	569
Lincoln Road	(780)	(2,091)	(2,766)
Middle Hotel	(838)	(1,159)	(1,347)

Source: *City of Miami Beach Parking Study*, Walker Parking Consultants, April 2003

1 Districts are defined as follows: South Pointe (6th Street to South Pointe Drive between Alton and Ocean); Ocean Drive (6th to 16th Streets between Washington and Ocean); West Avenue (5th to 17th Streets between West and Alton); Lincoln Road (16th-17th Streets between Alton and Washington); and Middle Hotel (Collins/Indian Creek Rd between Lincoln Rd and 41st Street).

2.4 Current Bus System

As many as 13 Miami-Dade Transit (MDT) Metrobus routes, presented in Figure 3, serve Miami Beach and carry an average of nearly 50,000 passengers per day. The L and the S routes, which provide access to the "mainland" to Hialeah and Downtown Miami, respectively, carry 44% of daily passenger boardings; and the MacArthur Causeway routes (i.e., K, S, M and C) carry the highest number of passengers of any of the Biscayne Bay crossings, as presented in Table 6.

Table 6 - Metrobus Passenger Traffic in Miami Beach by Route, 2003

Routes	Passenger Boardings Average Weekday
A – OBT to South Beach	393
C – Downtown Miami to So/Middle Beach	3,464
G – NW 27th Ave/163rd to So Beach	2,953
H – City of No Miami Beach to So. Beach	4,313
J – Douglas Rd Metrorail to Middle/No Beach	4,268
K – Downtown Miami to Miami Beach	4,154
L – Hialeah to So Beach	10,127
M – Civic Center to So/Middle Beach	1,799
R – 96th St/Harding to So Beach	525
S – Downtown Miami to Miami Beach/Aventura	11,777
T – Downtown Miami to Miami Beach/Haulover	2,304
W – South Beach Circulator	226
Flagler MAX – 137th/Coral Way to So Beach	3,057
TOTAL	**49,360**

Source: Miami Dade Transit Metrobus Passenger Boardings, April 2003

The Miami Beach routes are successful, in large part, because the Beach employs many residents of other cities in the region, and the Metrobus routes provide convenient access for Beach residents to Downtown Miami and its environs. An important factor is the high level of service provided within the Beach. As shown in Table 7, 10- and 12-minute peak hour headways are currently provided on the L and S routes, and most other routes provide between 2 and 3 buses per direction per peak hour. In addition, two routes (L and S routes) accommodate all night service.

The People's Transportation Plan will increase peak hour headways in 2005 to 7.5-minutes during the peak hour on the L route, and 15-minute service on ten other routes.

Figure 3
MDT Bus Route Map

Table 7 - Metrobus Passenger Traffic in Miami Beach by Headway, 2003 and 2005

Routes	2003 Headway	2005 Headway*	Other Changes in 2005
A	Peak Hr 20 min	Peak Hr 15 min	Weekends, from 60-30 min
C	Peak Hr 20 min	Peak Hr 15 min	All night service
G	Peak Hr 30 min	Peak Hr 15 min	Weekends, from 60-30 min
H	Peak Hr 20 min	Peak Hr 15 min	
J	Peak Hr 20 min	Peak Hr 15 min	All night service
K	Peak Hr 20 min	Peak Hr 15 min	
L	Peak Hr 10 min	Peak Hr 7.5 min	All night service
M	Peak Hr 30 min	Peak Hr 15 min	Weekends, from 60-30 min
R	Peak Hr 60 min	Peak Hr 15 min	Middays, from 60 to 30 min
S	Daily 12 min	Daily 10 min	All night service
T	Peak Hr 20 min	Peak Hr 15 min	
W	Peak hr 24 min	Peak hr 15 min	
Flagler MAX	Peak Hr 15 min	Peak Hr 15 min	Introduce 30-minute midday

Source: Miami Dade Transit Metrobus Passenger Boardings, April 2003

* *People's Transportation Plan Service Improvements through 2005*, MDMPO, 2003

In addition to the MDT services, the City of Miami Beach funds its own bus circulator service called Electrowave. The 11-bus Electrowave circulator fleet is in operation (every 5 to 10 minutes) between 8:00AM and 1:00AM, Monday through Saturday, and traverses Washington Avenue from So. Pointe Drive to 17th Street and Convention Center Drive, across Lincoln Road Mall, before returning south on Washington Avenue, as presented in Figure 4. In April 2003, ELECTROWAVE carried an average of 1,900 passengers/day.

While the Miami end of the Bay Link project may require many intermodal connections with other transit modes, the recommended Streetcar routes in Miami Beach don't require feeder services south of 18th Street, because most households and employment sites would be within a comfortable walking distance of the Streetcar route.

With respect to Miami Beach locations north of 18th Street, several MDT bus routes could provide excellent connections to the Streetcar without re-configuring their routes or schedules. In fact, many MDT routes should continue to operate because of: 1) the access they provide to dispersed parts of the region; and 2) because of the high transit demand produced in Miami Beach. All consideration ought to be given to finding ways to improve the reliability of MDT bus services – such as, providing dedicated street space for buses, providing transit pre-emption, and queue jumper bus lanes, etc – so that potential passengers can feel confident that the reliability provided on the Streetcar is duplicated in other parts of the system.

Figure 4
Electrowave Bus Route

2.5 Transit Funding Process

2.5.1 Federal – New Start Project Approval Process

The Intermodal Surface Transportation and Efficiency Act of 1991 (ISTEA), and its successor, the Transportation Equity Act for the 21st Century (TEA-21), established a step-by-step process as a means to enable communities to compare transportation improvements in a transportation corridor. The current process, which is set to expire on September 30, 2003, is being used for the *Bay Link* project. There are a number of changes in this process that are under consideration in Congress in the reauthorization of the transportation-funding bill.

Current procedures involve the following five key steps.

I. Major Investment Study/Alternatives Analysis. The first stage of the transportation project study process is a Major Investment Study that examines a broad range of options in a corridor. The MIS leads to specific options to be analyzed against one another in Alternatives Analysis.

The Alternatives Analysis phase of this process typically evaluates the capital cost of a conceptual project, potential environmental issues, travel timesavings, air quality impacts, population growth and economic development opportunities for each of the alternatives being studied. The products of the Alternatives Analysis are a Locally Preferred Alternative, selected by the sponsoring agency and approved by the Metropolitan Planning Organization, and a Draft Environmental Impact Statement (DEIS).

II. Preliminary Engineering. Upon selection of the Locally Preferred Alternative, the project's sponsor seeks approval from the Federal Transit Administration to advance a project through several phases, such as a Final Environmental Impact Statement (FEIS), and Preliminary Engineering (PE). Depending on the project, the PE phase can take anywhere from 6 to 36 months to complete. The products of the PE phase are the completion of the FEIS and a Record of Decision (ROD) issued by the Department of Transportation and Environmental Protection Agency.

III. FTA Project Ratings Process. In TEA-21, Congress formalized the project justification and approval process previously employed by FTA. Under TEA-21 FTA may not fund a project unless it determines that the project is based on alternatives analysis and preliminary engineering; justified based on a review of its mobility improvements, transit-supportive land use, environmental benefits, cost effectiveness and operating efficiencies; and, supported by an acceptable degree of stable and reliable financial sources to construct, maintain and operate the system or extension.

In making the project determination described above, the FTA is required to evaluate a project and develop ratings for each criteria or consideration contained in the current law. The FTA is required to evaluate a project using criteria such as reducing congestion,

improving air quality, local financial capacity, transit ridership and population density in the corridor, transit supportive land use and growth management (controlling urban sprawl). This evaluation process produces project ratings ranging from "Low," "Medium" and "High," which are then compiled into an overall rating that results in a project receiving a **Highly Recommended, Recommend** or **Not Recommended** rating. The purpose of such ratings was to both inform Congress and have Congress use these ratings to make project-funding decisions. These ratings are included in an annual report delivered to Congress each February and updated each August.

IV. Final Design. The FTA next approves a rated project to enter into Final Design. The FTA will not approve a project to enter into Final Design unless there is a commitment of non-section 5309 (i.e., FTA's program for capital costs for "New Starts" projects) funding for the construction of a project. Under TEA-21, FTA required that at least 20 percent of the non-section 5309 monies be from dedicated local and/or state monies. In practice, however, the non-federal portion of transit project funding has floated upward to 50%. Final design provides much more detailed information concerning the alignment of a project, station design and other engineering issues than PE. This phase provides the final cost estimates of a project and requires 12-36 months to complete. It is usually undertaken during negotiations on the Full Funding Grant Agreement (FFGA).

V. Full Funding Grant Agreement. A Full Funding Grant Agreement (FFGA) is an agreement entered into between the FTA and the project sponsor for the actual construction of a rail transit project. It details the scope of the project, the capital cost, including the source of all funds, the mitigation steps required by the FEIS and ROD, and legally binds the sponsor to complete the project set forth in the FFGA. Under the current law, FTA cannot execute a FFGA with a project sponsor until after the House Transportation and Infrastructure, the Senate Banking Housing and Urban Affairs and the House and Senate Appropriations, committees have an opportunity to review the FFGA, and do not object to the project going forward within sixty days of receipt of the FFGA.

2.5.2 Status of the *Bay Link* Project in the Federal Process

The *Bay Link* Locally Preferred Alternative (LPA) is on hold, awaiting a recommendation from the City of Miami Beach and action on that recommendation by the Board of the Miami-Dade Metropolitan Planning Organization. Responding to the City's request, the Board has deferred taking action on approval of the LPA until its September, 2003 meeting.

The Miami-Dade MPO has budgeted funding for the next stage of the process: preparation of a Final Environmental Impact Statement (FEIS). That work can begin as soon as the MDMPO Board has approved a Locally Preferred Alternative. The MDMPO and/or the Miami-Dade Office of Public Transportation Management, upon adoption of the LPA, can request Federal Transit Administration approval to begin Preliminary Engineering, as described above.

2.5.3 Regional

Passage of the People's Transportation Plan funding measure provides a substantial and reliable funding stream for regional transportation improvements. These funds may be used as local matching funds for projects that are eligible for federal funding, or may be used to fund projects locally. The Office of Public Transportation Management indicates that the measure will generate sufficient funds to, along with state funding, cover the expected local share requirements for the major regional transit projects already prioritized by the MDMPO (the North Corridor Metrorail extension, and the other transit components of the East-West corridor), and the Bay Link project. Although there are funds currently programmed into the regional transit funding effort managed by Miami-Dade County's Office of Public Transportation Management for an assumed $310 million project in this corridor, failure to approve a Locally Preferred Alternative for a transit project connecting Miami Beach with mainland destinations will open the possibility that the Miami-Dade MPO and the OPTM will shift their attention to other project opportunities in the region and, in effect, leave this project behind.

2.6 Public Involvement

Working with Miami Beach citizens was an integral part of the evaluation of rapid transit options for the City. Three workshops were held, in addition to briefings scheduled in July. The following sections highlight the results of each public involvement activity.

2.6.1 May 28 Workshop

On May 28, 2003 a Public Information Workshop was held in the Community Room of the Miami Beach Police Headquarters located at 1100 Washington Avenue. The City of Miami Beach handled the notification process for this workshop.

The purpose of the Workshop was to share ideas about rapid transit options for Miami Beach and to identify what is best for the City with regard to future transportation options. General project information was displayed for review, which included: four rapid transit technologies (light rail transit, bus rapid transit, trolleybus, and streetcar), the three light rail transit alternatives proposed in the Bay Link Draft Environmental Impact Statement, and a Street Typology Analysis prepared by the HDR team.

The Workshop began with a project presentation, followed by a general question and answer session. Full City maps were used for the presentations and the following small group discussions. After this session, the audience broke up into working groups to discuss issues and concerns about mobility in Miami Beach.

The issues highlighting the discussion included:

- Existing bus service needs improvement (noise, reliability, pollution, shelters, signage);
- Transit needs to serve all of Miami Beach, not just South Beach;

- Range of support, from no build to rail transit (light rail or streetcar), with all wanting to know more details;
- Consider the unique character of Miami Beach, particularly the setting (historic districts and architecture) and mixture with other modes (pedestrians, bicycles, and rollerbladers); and
- Solution needs to fit in with the rest of the region.

A summary of the Workshop activities is found in Appendix A.

2.6.2 June 9 Workshop with the Miami Beach City Commission

On June 9, 2003, the Miami Beach City Commission conducted a workshop in Room D 237-239 of the Miami Beach Convention Center, beginning at 6:00 p.m. The sole agenda item was to discuss the evaluation of the rapid transit options for Miami Beach.

The Workshop began with a brief presentation, providing an overview of evaluations that were underway. Following this briefing, the Workshop was open to a question and answer session between the City Commission members, the general public in attendance, and the HDR team. A summary of this Workshop is found in Appendix B.

The following issues highlighted the discussion:

- The desire to know more about the differences between the four technologies;
- Interest in serving all of Miami Beach;
- Consideration of hurricane evacuation, safety, and interaction with pedestrians as recommendations are developed;
- Consideration of including the West Avenue area as part of the route;
- Consideration of building rail and infrastructure improvements at the same time; and
- Concerns about changing the Washington Avenue median.
- Discussions about the "No-Build" Alternative.
- The ability to terminate the project after the LPA selection.

2.6.3 June 25 Workshop

On June 25, 2003 a Public Information Workshop was held in the Mona Lisa Room of the Eden Roc Hotel located at 4525 Collins Avenue. The City of Miami Beach handled the notification process for this workshop.

The purpose of the Workshop was to provide an update of the activities completed since the May 28 Workshop. The Workshop began with a project presentation which included: outlining the demographic profile of Miami Beach, identifying issues that influence growth and development, and reviewing the four rapid transit technologies (light rail transit, bus rapid transit, trolley bus, and streetcar). A general question and answer session followed the presentation. After this session, the audience had the opportunity to share their thoughts regarding future routes. A summary of this Workshop is found in Appendix C.

The following issues highlighted the discussion:

- Concerns about the overhead wires, especially for hurricane conditions and visual impacts;
- Need to connect to the rest of Miami Beach and the Region;
- Statements against transit;
- Statements favoring streetcar (including the Alliance for Reliable Transportation's adopted position supporting the streetcar);
- Interest in how this project would affect congestion;
- Consider the unique characteristics of Miami Beach – beach community, peak hours are different from standard time frames; multi-modal (cars plus pedestrians, skaters, skateboards, bicyclists); and
- Suggested routing includes: connecting the high school, Publix, Convention Center, the library, and the Bass Museum, in addition to Electrowave connecting Mt. Sinai Hospital to Collins Avenue as well as service into Mid Beach.

2.6.4 July Briefings

This study concludes with the presentation of the final recommendations being presented to the Miami Beach City Commission on July 10, 2003. Before July 10, the study's recommendations were shared with the following Miami Beach Boards: Transportation and Parking Committee (July 7), Historic Preservation Board (July 8), and Planning Board (July 8). Since these meetings will occur after the completion of this report, minutes will be found on the City's web site.

SECTION THREE – ANALYSIS

3.1 Review of *Bay Link* Draft Environmental Impact Statement

A review of the *Bay Link* DEIS was completed, providing a basis for evaluating rapid transit options for the City of Miami Beach. This document (known as a *Draft Environmental Impact Statement; Bay Link Supplemental Draft Environmental Impact Statement (October 2002),* updates the previous *East-West Multimodal Corridor Study*. With the failure of the local sales tax initiative in 1999, the project did not proceed through the federal approval process.

The purpose of the DEIS process is to develop and evaluate a series of alternatives and the associated impacts. In addition to identifying the maximum anticipated impacts, mitigation measures are also proposed. The intent is to comply with the National Environmental Policy Act, to determine any "fatal flaws" for a final set of recommendations.

The DEIS is focused on and organized around a "Purpose and Need" for a proposed project. As described in the *Bay Link* DEIS, the purpose and need for a project connecting Miami Beach with mainland destinations would be to:

- Connect downtown hotels, activity centers and tourist attractions to the Miami Beach Convention Center and other activity areas.
- Improve transit connections between MIA and Miami Beach (via the Airport-Earlington Heights Connector.
- Provide a connection between two of south Florida's high-density economic engines.
- Support sustainable growth in both residential and commercial development in these high-density areas.
- Provide area residents with enhanced transit options for a variety of trips within the corridor (Miami to Miami Beach and Miami Beach to Miami).
- To provide a transit option to the auto to reduce, or mitigate, the demand for parking in both centers.
- To more effectively tie Miami Beach to the rest of the regional transit system.
- To improve the effectiveness and benefits gained from existing transit capital investments.

The DEIS phase concludes with a public testimony (either at a public hearing(s) or via correspondence). After the public testimony period concludes, the document is revised into a Final Environmental Impact Statement (FEIS), based on the hearing's input. Once completed, the FEIS is submitted to the Federal Transit Administration for approval. This approval, known as a Record of Decision (or ROD), indicates that the identified impacts can be addressed (or "environmentally cleared") and the project's future activities qualify for federal funds.

For the Bay Link project, transit alternatives were studied, connecting downtown Miami to the City of Miami Beach. Work has not begun on the FEIS document since the City of Miami Beach has not taken action on a final set of recommendations (known as the Locally Preferred Alternative). The City has the opportunity to look at the work completed for the DEIS, and determine the most appropriate set of recommendations for Miami Beach. This input can be incorporated into the FEIS process as final mitigation measures are being defined for FTA approval.

The DEIS document was reviewed, focusing on the elements directly affecting the City of Miami Beach. The highlights from the DEIS review follow.

The document's focus is on transit connections between Downtown Miami and the South Beach area of Miami Beach. Overall, the document clearly discusses the issues and provides the framework for defining specific mitigation measures. The purpose of the DEIS document is identify the maximum anticipated impacts, and to determine if those impacts can be mitigated. Subsequent steps will detail actions. This section of the study highlights portions of the DEIS affecting the City of Miami Beach, with page references provided.

Background

- There are 55,000 employees working daily in Miami Beach, with over 35,000 working in the South Beach area. (page S-17)
- The South Pointe area is home to 45,000 residents. (page 3-27.) *NOTE: The DEIS does report this population level, and it incorrect. There are a total of 85,000 residents in Miami Beach. South Pointe is currently home to about 7500 people; build out at planned densities will add approximately 5,000 more.*)
- Counts revealed that on the average weekday approximately 8,000 passengers crossed the causeway on MDT buses, resulting in an average load of 16 passengers for the 500 buses making the daily trip. (page 4-4)
- Electrowave is the battery-powered bus service operating on Miami Beach as a local circulator wholly within the study area, with 46 stops using 22-foot shuttle buses, with 5 – 10 minute headways with two interconnected loops along Washington Avenue and Collins Avenue. (page 3-21)
- A significant portion of the Miami Beach area is occupied by residential use. (page 3-8)

Technology

- "No Build", Bus Rapid Transit (BRT), and Light Rail Transit (LRT) are the alternatives evaluated. However, through the scoping process, citizens suggested that the following additional modes be considered: ferry service, Metromover and MetroRail extensions, monorail, and suspended cable car. These additional suggestions were reviewed and dropped from more detailed evaluation.
- The DEIS recognizes that current bus service is unreliable, largely due to the congested environment and non-dedicated transit lanes and/or facilities.

Issues for Miami Beach

- *Parking Impacts* – Based on the use of a dedicated lane, a range of spaces would be lost with LRT (86 spaces for B1, 323 spaces for B2, and 226 for B3 in Table 4-11 on page 4-9); it is possible to replace all of the lost parking by double decking three small lots between Alton Road and West Road. (page 4-10)

- *Land Use and Development* – Growth and development is anticipated along Alton Road and Washington Avenue. (page 5-13)

- *Bicycle and Pedestrian Enhancements* – With LRT, bicycles would be allowed on board the LRT vehicle; pedestrian areas disrupted by LRT construction will be enhanced with vegetation, landscaping, and textured/colored concrete and pavers as a means of tying the stations to these pedestrian areas. (page 5-16)

- *Safety* – Discussion focuses on potential conflicts between trains and automobiles. (page 5-16)

- *Station Locations* – At-grade stations proposed for Miami Beach are: Washington Avenue at Lincoln Road and the Convention Center, Alton Road, and South Pointe. Mitigation measures include: landscaping & pedestrian plans, kiss-ride facilities, design to blend with surrounding character (page 5-20)

- *Cultural Resources* – Potential visual impacts involved with the introduction of catenary poles and overhead wires, but will not diminish the integrity of these resources. (page 5-29)

- *Rail Noise* – Mitigation measures must be evaluated for the LRT Alternative B2 at the South Pointe Elementary School. (page 5-47)

- *Visual and Aesthetics Impacts* – Catenary and power substations represent the visual impacts (Table 5-24, page 5-69); mitigation measures involve the treatment of the following items: vehicle, guideway, stations, electrification and distribution system, and parking facilities. (pages 5-73 through 5-81)

- *Impacts During Construction* – Short-term impacts are anticipated and working with business owners and operators recommended (page 5-84); estimated construction periods for BRT (18 months) and for LRT (32 months for B.1., 44 months for B.2, and 36 months for B.3. [Table 5-27 on page 5-93]).

3.2 Connectivity

3.2.1 Potential Extensions to Middle Beach and North Beach

Any of the transit modes can be expanded to serve the Middle and North Beach areas. Current and planned development and resulting population densities, geography, and the street system configuration combine to dictate that the north-south alignment of future phases will rely on Collins Avenue, and its partial couplets with Indian Creek Drive and Harding Avenue. A variety of options can be considered for short- or long-term loop

service at the northerly point of such extensions, including the established commercial and mixed-use districts along 41st, 63rd and 71st streets.

Of the four modes, the most difficult to site in this environment will be Light Rail Transit or Bus Rapid Transit in a separate guideway or busway. The large number of curb cuts and driveways in place to serve established condominium, apartment and hotel buildings makes the location and design of a separate trackway or busway problematic in portions of this area.

On the other hand, the configuration of the streets and the pattern of development and transit usage already in place is well suited to improved bus service or to in-street-running streetcar service.

In summary, Collins Avenue north of 22nd Street, and its southbound couplet streets are excellent bus streets today. They will be excellent corridors for study as a location for Bus Rapid Transit improvements or an extension of Streetcar or Trolleybus service.

3.2.2 Regional Transit System

In addition to providing frequent, comfortable and convenient service, transit systems must connect the origins and destinations of travelers. In fact, connectivity between Miami and Miami Beach is considered a regional priority in the adopted Long-Range Transportation Improvement Plan.

With stops every three to four blocks in Miami Beach, the Metrobus system provides direct connectivity to the region's major traffic generators (employment centers, government, non-profit and cultural institutions) and population centers. The Bay Link project is intended to reinforce and improve these connections by providing improved and reliable travel times and more direct connections to other transit modes (including Metromover, Metrorail; to MIA via Earlington Heights Metrorail extension; and to Tri-Rail via Metrorail).

The reliability and comfort provided by a Streetcar is expected to generate a large number of "choice-rider" passengers (i.e., travelers who use transit when they have access to an automobile); who are expected to experience a competitive travel time with the automobile on highway routes that are within the Bay Link corridor.

3.3 Contextual Comparison of Technologies

Four alternative transit modes were evaluated for use within context of Miami Beach. The four modes considered include

- Bus Rapid Transit (BRT);
- Light Rail Transit (LRT);
- Streetcar Transit;
- Trolleybus; and
- "Trolley-Type" Bus.

Each mode has specific characteristics that provide advantages, disadvantages, and unique performance attributes based on differing applications.

3.3.1 Bus Rapid Transit (BRT)

With rising demands for federal transit funding, the FTA developed the concept of Bus Rapid Transit as a lower cost alternative to Light Rail Transit, hoping to extend allowable funding levels. To be more competitive as a technology, new vehicle designs are being developed to give a more contemporary image. BRT is a technology that provides a variety of improvements that allow rubber tired, fossil fuel powered bus service to operate more quickly, efficiently and comfortably. Bus Rapid Transit involves coordinated improvements in infrastructure, equipment, operations and technology that give preferential treatment to buses on urban roadways. Bus Rapid Transit is not a single type of transit system, but rather encompasses a variety of approaches, including buses using exclusive busways, sharing HOV lanes with other vehicles, and improving bus service running in mixed traffic on city streets.

BRT Vehicle in An Exclusive Busway

BRT Vehicle

The following features characterize BRT technology.

Exclusive Busway or HOV/Limited Access Roadway – Busways are special roadways designed for exclusive use of buses and can be totally separated roadways or operate within highway rights-of-way separated from other traffic by barriers. Buses on HOV lanes operate on limited access highways designed for long distance commuters. Bus Rapid Transit Systems using arterial streets may include lanes reserved for the exclusive use of buses and street enhancements that speed bus travel and improve service.

Traffic Signal Priority – Traffic signal operations are designed to give preference to buses. As the bus travels along its route, electronic sensors provide indications to alert the traffic signal control box. The bus indication triggers a subroutine within the signalization program to shorten or eliminate intersection wait times for buses. In-city travel times are significantly reduced.

Boarding and Fare Collection Improvements – Convenient and rapid fare collection through prepaid or electronic passes and low-floor and/or wide-door boarding results in time savings.

Limited Stops – Increasing distances between stations or shelters improves operating speeds.

Improved Stations and Shelters – Bus terminals and unique stations or shelters differentiate Bus Rapid Transit service from standard bus service.

Intelligent Transportation Systems Technologies – Advanced technology can maintain more consistent distances between buses and inform passengers when the next bus is arriving.

Modern Streamlined Vehicles – To help improve the attractiveness of the technology over standard buses, new, streamlined vehicle designs were developed. These "modern" designs also offer a variety of seating options that provide easier boarding, smoother rides, with more appeal to the riding public.

Advantages

- Minimal construction disruption, unless there is a fixed guideway.
- Greater flexibility, using both separate guideways or in-street running capabilities.
- Ability to enter and leave the fixed guideway.
- Articulated buses have favorable turning radii.
- Overhead contact system not required.
- At-grade street crossings accommodated.
- Potential cost savings compared to rail transit systems.
- More attractive than typical buses.
- Higher speeds available on the Causeway segment to meet regional connectivity demands.

Disadvantages

- Lower capacity than rail transit systems.
- Limited history in revenue service.
- Air quality effects if fossil fuel-powered.
- Unknown effects on land use and economic development changes.
- Unknown ability to attract choice riders.
- Significant engineering and visual consequences if portions of the system are elevated.

- May not correspond to the image of Miami Beach.
- Bus technologies generally have higher long-term operating and maintenance costs.

Miami Beach BRT Implications

- Existing street parking, number of lanes and street routing of buses within Miami Beach may be maintained, unless a separate guideway is used.
- Flexibility to extend routes, change routes, bypass lane closings and service existing communities with little construction disruption.
- Exclusive bus only lanes may be considered within Miami Beach for use at certain times. However, mixed traffic operations are recommended to reduce impact on existing on-street parking and street traffic.
- Implementation of a variety of traffic management measures will be required for the portions of the project in mixed traffic operations.
- MacArthur Causeway crossing could be constructed to accommodate bus only use.

3.3.2 Light Rail Transit (LRT)

Light rail transit represents a steel wheeled transit system on steel rails powered by overhead catenary consisting of single cars or short trains. Light rail vehicles may operate along exclusive rights-of-way at ground level, on aerial structures, in subways or in mixed traffic. Passengers can board and discharge passengers at track level or on elevated platforms. LRT technology is widely used as a public transit system. Over 40% of FTA New Starts funding is applied to LRT systems. A distinctive feature of light rail transit is that vehicles draw power from an overhead wire. Unlike rail systems that draw power from a powered third rail at grade, this overhead power collection system allows Light Rail Transit to be integrated with other at-grade transportation and pedestrians in mixed traffic. With overhead power collection and the availability of articulated LRT vehicles (two cars "hinged together"), LRT can operate in mixed traffic on tracks embedded in the street, on at-grade rights-of-way with street and pedestrian crossings, or on exclusive rights-of-way.

Top speeds for light rail transit range from 45 to 60 mph, while average speeds including station stops range between 15 and 30 mph. The passenger carrying capacity varies between 4,000 and 15,000 persons per hour per track. Capital cost per mile for light rail transit can be in the range of $45 million to $75 million per mile, although costs can be much higher when LRT is put on an aerial structure or in tunnels.

Low Floor LRT Allows Easy Boarding

LRT Vehicles May be Coupled for Increased Capacity

Key characteristics of LRT include:

- LRT vehicles can operate as a single car or multi-unit train. This transit mode provides the highest passenger carrying capacity of all of the alternatives considered for Miami Beach.
- Vehicles may operate at maximum operating speed. This feature is not significant in the urban environment but is a benefit in traversing longer unencumbered distances such as over the MacArthur Causeway to and from Miami Beach.
- Steel wheels on steel rails provide a smooth ride with a vehicle performance that offers gradual acceleration and deceleration.

Advantages

- Attracts "choice riders"
- High reliability. Widely used in public transit systems.
- High passenger volume. Single cars, and/or articulated cars that may be coupled into longer train lengths.
- Can operate within dedicated lanes and mixed traffic. Vehicles can accommodate at-grade street crossings.
- Low floor vehicles allow easy boarding.
- No adverse air quality effects.
- Higher speeds available on the Causeway segment to meet regional connectivity demands.
- Lower long-term operating and maintenance costs compared to bus/BRT.

Disadvantages

- Typically uses overhead contact system.
- Higher business and neighborhood impacts due to construction complexity and length of construction period.
- Greater traffic impact with dedicated guideway.
- Greater traffic disruptions with mixed traffic.
- Elevated systems are more expensive and visually obtrusive.
- Largest vehicle of the technologies considered.

Miami Beach LRT Implications

- Construction disruption may require 30-36 months over the full project length.
- Dedicated LRT lanes within Miami Beach would constrict existing surface traffic and eliminate portions of on-street parking.
- Median landscaping will be sacrificed on Washington Avenue, if a dedicated trackway is constructed.
- High passenger capacity of multiple LRT cars will most likely not be required for the projected Miami Beach's local circulation and ridership.
- Low floor vehicles allow easy boarding and relatively unobtrusive station platforms/stops.
- High floor LRT vehicles and partial high block ADA station platforms would present negative aesthetic impacts in Miami Beach streetscape.
- The scale of the technology is less visually compatible with the City's historic and cultural resources than the other modes evaluated.

3.3.3 Streetcar Transit

Streetcars are rail transit vehicles designed for local transportation, powered by electricity received from an overhead wire. Streetcars are derivatives of light rail transit and can actually share the same tracks. The main difference between the streetcar and LRT modes is purpose. Streetcars are designed for local transportation. A light rail line may operate at higher speeds and over greater distances between a downtown area and outlying stations. Streetcars, on the other hand, service closely spaced stations typically in an urban environment.

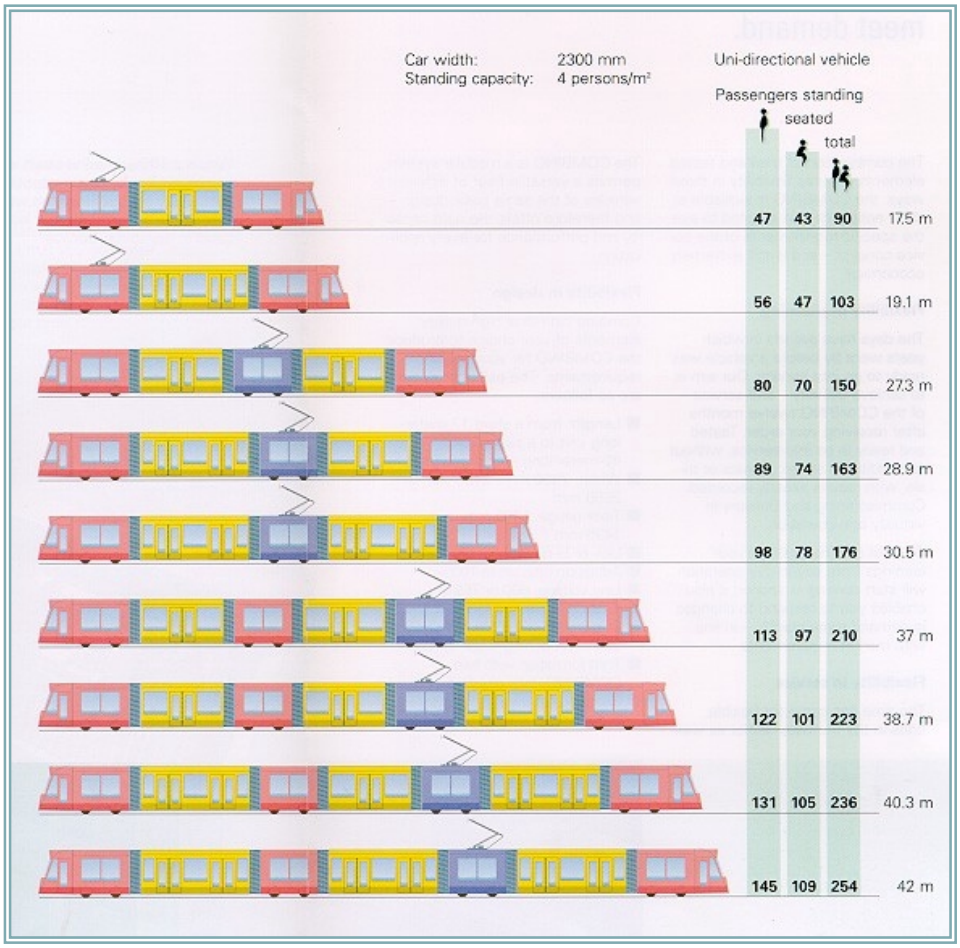
Portland, Oregon

Modern Articulated Streetcar Vehicle

One difference between Streetcars and LRT vehicles is that Streetcars are lighter weight than LRT (65,000 – 80,000 lbs vs. 110,000 lbs or more). This lighter weight allows for a shallower pavement section with embedded track and less costly construction. Streetcar vehicles are available in a number of different designs. Design features available for specific project applications include:

- Length-width
- 1 or 2 cabs
- Doors
- Interior (number and orientation of seats)
- Track gauge (spacing between rails)
- Voltage
- End styling

Available streetcar vehicle dimensioning is variable. The following graphic illustrates the ability to combine vehicles to meet specific needs.



Advantages

- Choice riders are attracted.
- Existing streets or dedicated guideways are utilized.
- Controllable construction sequencing to minimize disruption.
- Less expensive construction methods compared to LRT.
- Potential vehicle cost savings compared to LRT.
- Lower costs for system expansion.
- No negative air quality effects.
- Can operate in mixed traffic.
- Stimulates land use and economic development changes.
- Promote and enhance the pedestrian environment.
- Interfaces with bus and LRT technologies.

- Scale of vehicle compatible with urban settings.
- More frequent stops are possible due to operating characteristics.
- Smaller turning radii than LRT.
- Higher speeds available on the Causeway segment to meet regional connectivity demands.
- Expensive stations are not required; "Off-the-Shelf" equipment and accessories are often the norm.
- Lower long-term operating and maintenance costs compared to bus/BRT.

Disadvantages

- Overhead contact system
- Lower passenger capacity than LRT.
- Construction costs generally more expensive than BRT.
- Construction impact greater than BRT, Trolleybus.

Miami Beach Streetcar Implications

- Short construction period for in-street rail segments allows "maintenance of business".
- Low floor vehicles allow easy boarding and the construction of unobtrusive station stop platforms.
- Operation within mixed traffic maintains traffic lanes, parking lanes or median landscaping.
- Implementation of a variety of traffic management measures will be required for the portions of the project in mixed traffic operations.
- Simple span wire presents some aesthetic impacts but not as great as LRT or Trolleybus catenary systems.
- The Streetcar replicates the historic transit mode on the streets of Miami Beach, and the size of the modern vehicle "fits" with the existing urban scale and character.
- Regional connectivity and local City-serving benefits are optimized.
- The system has excellent expansion capabilities for Middle and North Beach communities.
- Multiple regional and local markets (residential, visitor and convention, retail and office and recreation) are more widely served than by LRT or BRT.

3.3.4 Trolleybus Transit

Electric Trolleybuses

The vehicle consists of rubber tires on pavement with an overhead electrical power source. The system is trackless but follows the fixed route of the overhead power wire. Vehicles are available as a single bus or an articulated double vehicle. This transit system has lower passenger capacity than LRT.

Trolleybus technology developed from the desire to eliminate exhaust air quality impacts from existing bus routes. Only five cities continue to operate trolley bus systems in the United States: Boston, Philadelphia, Dayton, San Francisco and Seattle.

Trolleybus in Service (Philadelphia)

Articulated Trolleybus Vehicle

Advantages

- Utilizes existing streets or dedicated busway.
- Minor construction disruption.
- Lower initial capital costs compared to LRT and Streetcar.
- Minimal expansion costs.
- No air quality effects.
- Can operate in mixed traffic.
- No track in roadway

Disadvantages

- More elaborate overhead contact system.
- Lower capacity than rail transit modes.
- No evidence that choice riders are attracted.
- No documented effects on land use and economic development changes.
- Higher long-term operating and maintenance costs compared to LRT/Streetcar.

Miami Beach Trolleybus Implications

- System is not widely used; reliability is a concern.
- Service would be similar to bus service with exception that overhead wiring would be required.
- Passenger capacity is lower than rail transit modes.
- Vehicles may operate in mixed traffic. No reduction in street parking or travel lanes would be required.
- Implementation of a variety of traffic management measures will be required for the portions of the project in mixed traffic operations.

Trolley-Style Buses

These vehicles are specialty buses designed to simulate the look and feel of a turn of the century streetcar. These buses are built on a standard bus chassis, and are equipped with an ornate period style body, and features such as wooden plank bench seats and brass fittings to reflect period styling. The buses are equipped with modern amenities including heating, air conditioning, air ride suspension, and may be equipped with a farebox. The vehicles have modern engines and may be powered by diesel, natural gas or propane. Stairs at the entrance are used for boarding. Buses are equipped with wheelchair hydraulic lifts and wheelchair tie-downs.

The "Vintage Trolley-style Bus" has a typical capacity for 28 passengers. This type of transit system is not intended to transport a large number of riders. Primarily, the buses have been utilized by a number of cities to service a limited number of passengers within tourist, historic and concentrated business districts. Cities utilizing vintage trolleys include: -

Austin, TX	Birmingham, AL	Charleston, SC
Charlotte, NC	Corpus Christi, TX	Dallas, TX
Detroit, MI	El Paso, TX	Ft. Worth, TX
Houston, TX	Norfolk, VA	Oklahoma City, OK
Providence, RI	Sacramento, CA	Savannah, GA
Tampa, FL	Coral Gables, FL	

Savannah, Georgia

Austin, Texas

Advantages

- Presents a nostalgic image.
- Utilizes existing streets.
- No construction disruption.
- No overhead electrical contact system.
- Flexible routing.
- Low cost.
- Can operate in mixed traffic.
- No tracks in street.

Disadvantages

- Limited passenger capacity; does not serve as high capacity urban transit.
- Lower operating speeds.
- Ineligible for FTA "New Starts" funding.
- Air quality effects.

Miami Beach Vintage Trolley Implications

- Service would be similar to the existing Electrowave bus service. A vintage trolley would likely mirror current service.
- Extreme difficulty in transporting large number of riders during a peak period.
- Flexibility in routing provides ability to service a large area.
- Stair boarding and small interiors may discourage some riders while styling may attract other riders.

3.3.5 Transit Technologies: Meeting Miami Beach's Goals

As noted in the previous discussion of the candidate transit modes, there are several important considerations for Miami Beach with respect to the selection of a rapid transit mode. These considerations were drafted into the following criteria:

- Compatibility with the unique character and the scale of Miami Beach.
- Ability for a rapid transit modal option to enhance and reinforce the established streetscape and pedestrian environment of Miami Beach.
- Meet Miami Beach's circulation and mobility needs.
- Have the ability to be feasibly (both physical and economical feasibility) extended to Middle and North Beach areas.
- Have minimal disruption to resident and business activities, and public services, during construction.
- Be compatible with the existing and planned regional transit system.

- Advance a rapid transit project(s) that is eligible for federal funding.
- Advance a mode(s) that provides a high level of passenger comfort and attractiveness.

An analysis of the candidate modes against these criteria is illustrated in Table 8. In summary, the Streetcar option would best meet these criteria, followed by LRT, BRT and other bus systems. Streetcars are compatible with the City's streetscape, public art and amenities, and would enhance the pedestrian environment. Streetcars are compatible with the region's high-capacity transit system, and due to their relative low cost, can be extended north to the Middle and North Beach areas. Construction disruption is relatively minor with Streetcars because the depth of the track bed is only 12 inches or so, and would not force relocation of utilities (which is often the most time-consuming stage of street construction). Finally, streetcars are an eligible mode for FTA funding, and they provide a very high level of comfort for passengers.

Table 8 - Transit Technologies: Meeting Project Goals

	Light Rail Transit (LRT)	Bus Rapid Transit (BRT)	Streetcar	Electric Trolleybus	Standard (MDTA) Bus
Compatible with Character and Scale of Miami Beach?	◐	◐	●	◐	◐
Would Enhance Streetscape and Pedestrian Environment?	●	◐	●	◐	◐
Would Provide Local and Regional Circulation for Residents?	●	●	●	◐	◐
Would be Economically and Physically Feasible to Extend to Middle and North Beach?	◐	●	●	●	●
Would not Result in Significant Construction Disruption?	○	◐	◐	◐	●
Is the Mode Compatible with the Regional Transit System?	●	●	●	○	●
Is the Mode Eligible for FTA Funding?	●	●	●	◐	●
Does the Mode Provide a High Level of Passenger Comfort?	●	○	●	○	○
Composite Score	**20**	**19**	**23**	**15**	**19**

● = Yes (3 points) ◐ = Moderate (2 points) ○ = No (1 point)

The criterion where LRT systems are not as positive for the City as Streetcar systems includes the significant disruption during construction, as well as the vehicles being larger and heavier, and less in keeping with the scale of the City. Similarly, BRT and standard bus systems do not score as high in fitting in with the unique character of the City, and would represent a relatively lower level of comfort for passengers. Moreover, standard bus systems would not enhance the streetscape nor would they provide for reliable access for regional trips.

Electric Trolleybus systems were determined to be relatively incompatible with more of these criteria. They would not be compatible with the region's transportation systems, and would provide a relatively low level of improvement over current bus survive for passengers.

3.4 Cost Comparisons

The information found in Table 9 compares the costs among the five technologies evaluated for Miami Beach.

Table 9 – Transit Mode Attributes and Cost Comparison

Transit Alternative	Cost/ Mile[1]	Speed (MPH)	Construction Impact	Passengers per Vehicle[1]	Power system	Guideway
Light Rail Transit	$48M	55mph (peak)	Moderate	120 (Total 72 (Seated)[2]	Electric Powered, overhead.	Exclusive or can share street with traffic
Street Car Transit	$24M	50mph (peak)	Minimal/Moderate	90 (Total) 43(Seated)[2]	Electric Powered, overhead.	Can share street with traffic
Bus Rapid Transit	$22M	65mph (peak)	Minimal	80 (Total) 55 (Seated)	Standard Bus or Electric Powered	Dedicated guideways, bus only lanes, HOV lanes or mixed traffic.
Electric Trolleybus	$6.5 M	50mph (peak)	Minimal/Moderate	76 (Total) 54 (Seated)	Electric Powered, overhead	Dedicated guideways, bus only lanes, HOV lanes or mixed traffic.
"Trolley-Type" Bus	$0.5 M	50mph (peak)	None	28 (Total) 22 (Seated)	Diesel, Propane or Natural Gas	City streets and/or dedicated lanes

1 Typical values shown. Actual values vary per system and per vehicle model selected.
2 One car capacity. Two to three cars may be coupled to form longer units.

3.5 Implications for Street Design

The street design impacts of a transit system are analyzed based on previous findings discussed in Section 2. Five corridors are identified as best suited for the Streetcar, and shorter connectors link those corridors. The North-South corridors are Alton Road and Washington Avenue. There is also the possibility of extending the system on the Collins Avenue corridor, north of 22nd Avenue, utilizing Collins itself and its southbound couplet streets, Indian Creek Drive and Harding Avenue. The East-West corridors are 5th Street, 17th Street and Dade Boulevard, and their connectors are 22nd Street, 17th Street, and 1st Street.

To analyze the implications of developing a Streetcar on the listed streets, each street was evaluated separately to determine if mixed Streetcar and automobile traffic was feasible. A determination as to what lanes to select was made, as were general assumptions for boarding platform locations. In most of the alignment, the transit system will utilize the curbside travel lane mixed with vehicular traffic, and boarding platforms will be located on curb extensions constructed in the parking lane. This eliminates up to four on-street parking spaces per station stop. On Washington Avenue, the median–side travel lane is utilized, also in a mixed-traffic condition, with boarding platforms located in the median. Platforms will be strategically located so as to minimally disrupt the areas where new landscaping has been developed.

SECTION FOUR – RECOMMENDATIONS

Washington Avenue at Lincoln Road, Showing Streetcar Transit in Operation

4.1 Recommended Technology and Alignments

4.1.1 Technology and Alignment

The recommended transit technology for the Miami Beach portion of the proposed *Bay Link* Transportation Corridor is in-street-running Streetcar transit. The Streetcar is, among the various modes available, the best "fit" with the environment and character of Miami Beach. The scale of the vehicles, and the location of the track - flush in the street surface of a shared travel lane - make it possible to add the ingredient of high-capacity transit to an already very lively streetscape without overwhelming or radically changing its design. The trackway and overhead catenary system can be constructed in a process that has minimal impacts on surrounding properties and on use of the streets. Electric propulsion means the vehicles will be clean and quiet, essential characteristics in a busy, livable city. Expansion of this option northward into Mid- and North Beach is practicable, whether as a subsequent phase to the project recommended in this study or as a stand-alone project.

Rail transit, both Streetcar and Light Rail, has demonstrated positive economic effects in property values, commercial leasing and retail sales. For example the Portland Streetcar line has sparked $1 billion of transit-oriented development in five years, and property values for existing buildings in the corridor are increasing 40 % faster than similar property outside of the corridor. These positive economic effects will help support and protect the long-term commercial viability of Miami Beach businesses. Given the limited capacity of the street system for automobile traffic, an additional transportation choice, which allows more customers to reach Miami Beach stores, restaurants, and other commercial establishments, will improve the long-term viability of these businesses and the historic buildings in which they are located.

The recommended Streetcar alignment is a hybrid of the three alternatives described in the DEIS, with additional modifications. As shown in Figure 5, the route consists of two

functionally distinct loops. In some portions of the alignment, the proposed trackway will be located in the right travel lane of the street; in these portions of the route, station stops will be constructed as curb extensions. Other portions of the alignment locate the trackway in the left travel lane; in these sections, station stops will be constructed in the median area.

(1) A counterclockwise one-way route, depicted in Figure 5 as a red line and denoted as the "Downtown Connector," connects to the City of Miami by the MacArthur Causeway, accessing and departing from Miami Beach's street grid at 5th Street and Alton Road. From that point, it proceeds eastward along 5th Street, running in the right lane and utilizing curbside station stops. At Washington Avenue, the loop turns North, running in the left lane and utilizing station stops in the center median, until reaching 17th Street, at which point it turns West and runs in the right lane of 17th, utilizing curbside station stops. At Alton Road, the route turn South, running in the right lane and utilizing station stops constructed as curb extensions in the parking lane until it returns to the intersection of 5th and Alton, where it turns West into the causeway section.

(2) A clockwise one-way route depicted in Figure 5 as a blue line and described as the "South Beach Circulator." Beginning at the intersection of 5th Street and Alton Road, this route runs North on Alton Road in the right lane, utilizing station stops constructed in the parking lane as curb extensions. Reaching Dade Boulevard, the circulator route turns Northeast onto the right lane of Dade and continues until it reaches the intersection with 23rd Street, at which point it turns directly East onto 23rd Street, running in the single eastbound lane. At Park Avenue, the route turns South for one block, running in the left travel lane, until reaching 22nd Avenue, where it turns East, running in the right lane of the two-lane street and utilizing curbside station stops. At Collins Avenue, the route turns south, running in the right lane and utilizing curbside station stops until reaching 17th Street, where it turns west. This section runs in the westbound lane of 17th Street until reaching the intersection with Washington Avenue, at which point, it turns South into the left lane of Washington Avenue and utilizes station stops constructed in the median, continuing to 1st Street. At 1st Street, the route turns West, running in the single westbound lane of 1st, then turning north into the right lane of Alton Road to the beginning point.

4.1.2 Alignment Options for Further Consideration

Three localized variations of the alignment should be considered by Miami Beach and could be carried forward into Preliminary Engineering for further review, as presented in Figure 6. Both are located along the "South Beach Circulator" loop.

(1) Eliminate the South Pointe Triangle

Residents as far south as 2nd Street are within a reasonable walking distance of a transit line located on 5th Street. The cost and local disruption of this 4200-foot section could be avoided by running the Westbound portion of the "South Beach

Recommended Route

Figure 6

Route Options

help induce reinvestment and redevelopment along 5th. On the other side of the ledger, the convenience of the line for a large number of residents in the South Pointe district would be reduced. The net change in length as a result of these changes would be a reduction of 3100 feet

(2) Extend the South Pointe Triangle

The opposite approach to the option described above could also be considered: to try to serve South Pointe residents *better* with a more generous alignment which directly accesses many of the larger parcels in this neighborhood which are still undeveloped. The net change in length as a result of this change would be an addition of approximately 500 feet.

(3) Turn onto 22nd at Washington

Turning from Dade Boulevard onto 22nd Street at the intersection of Dade Boulevard presents some pluses and minuses. On one hand, the turn would occur in a complex, non-standard intersection, requiring signal pre-emption and intersection redesign. On the other hand, this would be a more direct route to the emerging cultural district at 22nd Street and Liberty Avenue, involving fewer and easier turns. The net change in length as a result of this change would be a reduction of approximately 500 feet.

Section 4.1.3 Alignment Options to Middle and North Beach

A key attribute of the "South Beach Circulator" route is that it has the ability to continue north to serve the Middle and North Beach areas after the service has become established. As discussed earlier in Section 3.2.1, Collins Avenue, along with its couplets formed with Harding Avenue and Indian Creek Road, provides a direct and convenient expansion of the route, which could be an important means of access and mobility for those densely populated neighborhoods and commercial districts adjacent to Collins Avenue. An important benefit of the Collins Avenue route is the minimal disruption to the Streetcar's north and south flow from cross street movements.

As shown in Figure 7, this alignment would be situated as follows:

Northbound Travel:
From the South Beach Local Route station at the Cultural Center stop (on 22nd Street west of Collins Avenue), the Streetcar would turn left onto Collins and proceed north to 73rd Street. The Streetcar route would make the necessary turns to remain on Collins northbound. At 73rd Street, the Streetcar would turn left around a large parking lot, and turn left again onto Harding Avenue to begin its southbound trip.

Southbound Travel:
From its intersection at 73rd Street, the Streetcar would travel south on Harding Avenue, continuing south until its merge into Collins Avenue. The Streetcar would continue south on Collins Avenue and merge with Indian Creek Road to continue the southbound route, until it merges back to Collins and south to link up with the South Beach Local Route (as shown in Figure 5) at the Cultural Center stop on Collins between 22nd and 21st Streets.

Section 4.1.4 Responding to Community Concerns

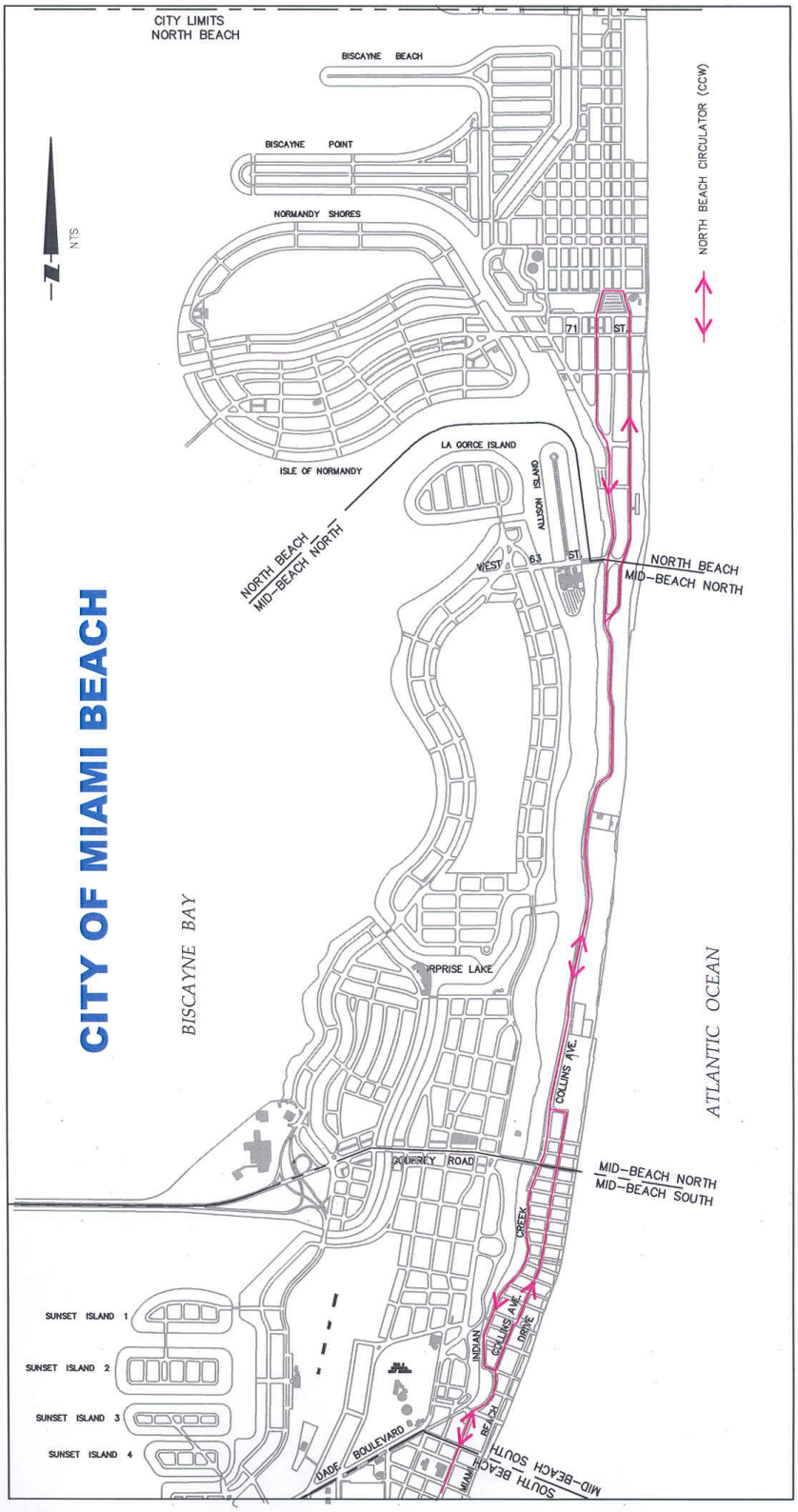
Selecting this option to carry forward into the next phase of the study process responds to legitimate community concerns expressed during this review:

- Additional information is needed to justify a rapid transit option;
- Fitting the project into an attractive, architecturally significant place;
- Avoiding the disruption of a long construction process;
- Avoiding loss of on-street parking and automobile travel lanes;
- Reaching and serving more of the Miami Beach community.

Section 4.1.5 Implications for Electrowave and MDTA Bus Service

While the question of which Metrobus services would continue to be needed can be answered in a Miami Beach Transit Master Plan effort, the South Beach Circulator described in the previous paragraph would effectively eliminate the need for the City of Miami Beach funded Electrowave shuttle bus service. The recommended South Beach Circulator alignment duplicates the routing used by Electrowave, and would not only better serve City residents, but visitors and tourists as well. The City would thus have the option of discontinuing the Electrowave service, or relocating it to serve other community transit needs.

Figure 7
Possible Extension to Middle and North Beach



4.2 Locally Preferred Alternative Conditions

The following are recommended as conditions to be attached to the City's adoption of a Locally Preferred Alternative for this corridor, to be incorporated as mitigation measures in the Final Environmental Impact Statement and as technical requirements for Preliminary Engineering.

4.2.1 System Design

Low-floor, articulated vehicles should be specified. Vehicle length should not exceed eighty feet and vehicle weight should not exceed eighty thousand pounds. The specified track design is an imbedded slab, flush with the street surface, allowing mixed traffic use of the lane in which the trackslab is located. Design of the Overhead Catenary System (OCS) for the project will be subject to review and approval by the City of Miami Beach. Design techniques that reduce the visual impact of the OCS through the use of building anchors for span wires, shared use of poles, placement of poles and other urban design measures will be emphasized in meeting this condition.

4.2.2 Station and Shelter Location and Design

Location and design of stop platforms, shelters, and associated street furniture will be subject to review and approval by the City of Miami Beach. Stop platform design will be congruent with the City's streetscape plans. Shelter design will, through the use of materials, vegetation, and other means, provide acceptable comfort for the user of the system in terms of temperature mitigation, sun and glare protection, and protection from rainfall and splashing from standing water.

4.2.3 Bicycle Parking

The project sponsor will include provision for bicycle parking near station stops, working with the City of Miami Beach to determine quality, location and design of bicycle parking areas.

4.2.4 Construction Practices

The project sponsor will provide to the City of Miami Beach a Maintenance-of-Way/Maintenance-of-Business Plan for the portion of the project to be built in the City. The plan will provide for:

- The use of best practices in the construction of the trackway, the Overhead Catenary System, and other work in the public right-of-way, with the objective of minimizing disruption to pedestrian access, business operations, and automobile traffic.
- Construction staging, contractor incentives/penalties and similar measures, to minimize the duration and work area of in-street construction.

- A business outreach and assistance program, designed to communicate effectively with individual businesses affected by the construction process and with the general public.
- A Business Loss Mitigation Program that assists businesses financially impacted by project construction.

4.2.5 Public Art

Project funds allocated for public art and any county-collected contribution for art in public places shall be apportioned to Miami Beach for the portion of the project that will be constructed within Miami Beach's corporate limits. The City will place those funds in its Art in Public Places account, and expend those funds for public art along the project alignment.

4.2.6 Real Time Arrival Information

Project design will include provision of real time arrival information at station stops, using the Geographic Position System or other means to accurately inform system users when the next vehicle will arrive at a given station stop.

4.2.7 Bus System Plan

The project sponsor, in coordination with the Miami-Dade Transit Authority and the City of Miami Beach, will prepare a Bus System Plan for Miami Beach that will address:

- Preparation of an Origins and destinations study for transit in Miami Beach;
- Interim bus operations during the construction period;
- Coordination of City-provided shuttle service during the construction period;
- Integration of City-provided shuttle service (if continued) with the revised MDTA Operations Plan.
- A revised route and service plan which optimizes connections to portions of Miami Beach beyond the current extent of the Project and which minimizes bus operations in areas served by the Project.

4.3 Action Plan for Miami Beach

To meet the City of Miami Beach's objectives, the following Action Plan is recommended to City staff and the relevant citizen Boards. This Action Plan would not only work to improve mobility for the greatest number of residents, employees and visitors, but also do so in a manner that meets and exceeds the City's high standards for urban design, preservation of cultural resources, use of non-motorized modes (i.e., walking and bicycling) and transit, public art, and other planning and urban design considerations.

4.3.1 Streetscape Plans should be updated to integrate the Streetcar project

The City's streetscape (i.e., its sidewalks, curbs, landscaping, medians, street furniture, street poles, bus shelters, trash cans, and adornments such as flower baskets, banners and special lighting, etc.) is essential to the function and character of Miami Beach. Streetscape design provides an initial and lasting impression for residents, employees, visitors and tourists. A transit project provides multiple opportunities to significantly enhance the design themes present in the City; it should be developed through a technical design process and a public review process that coordinates City plans and requirements for streetscape improvements with the location of the Streetcar project.

4.3.2 Design Review Criteria should be revised to guide project elements and private development

The City of Miami Beach's Comprehensive Plan, Zoning Ordinance, and other planning and design regulations and guidance do not discuss the design characteristics, standards and design criteria associated with a transit system. Such criteria would address the City's standards for safety, urban design and streetscape amenities, traffic control, signage, adjacent parking and travel lanes, etc. Many of these standards would reference national and industry-wide standards for construction and operation, while others would address the unique, local design issues and objectives.

Specifically, these criteria should address the appearance and function of station areas, transit equipment and facilities, logos, impact on the pedestrian and roadway environment, sensitivity and reinforcement of the design of cultural and historic districts, etc.

Criteria applied to proposed development in the transit corridor should be revised to maximize the positive impact of the project, including:

- Building entrances;
- Blank wall restrictions/prohibitions;
- Fenestration and transparency;
- Awnings, shade, and shelter;
- Landscaping;
- Sidewalk use and maintenance of walk zone;
- Curb cuts and parking.

4.3.3 Pedestrian/Bicycle Plan

In addition to the engineering and standards development for the roads that the rapid transit service will use, the City will want to ensure that the Streetcar project does not impede, and in fact reinforces, pedestrian and bicycle circulation throughout the Beach.

Special attention always needs to be provided to pedestrians and bicyclists – in part, because they have the most limited amount of space -- and the transit project provides many opportunities for enhancements of those systems. Updates to all relevant adopted City documents that reference pedestrian and bicycle travel is recommended, as well as the development of specific bicycle parking areas listed above.

4.3.4 Alton Road Redevelopment Plan

As stated above under Design Review Criteria, several City, County and State design codes and regulations will need to be amended to address the development of the rapid transit service along Miami Beach streets. Alton Road, between 5th Street and Dade Blvd, has been recommended as one of the two primary streets for the Streetcar service, and will be significantly affected and enhanced by the service. Since there is no mention of a transit project in the adopted Alton Road Redevelopment Plan, the Plan will need to be amended to incorporate the Streetcar project. Ideally, this amended Redevelopment Plan would follow the adoption of amended design review criteria (see Section 4.3.1)

4.3.6 Independent Review of the PE/FEIS Process to Assure Compliance with Conditions

During the FEIS, mitigation measures are more specifically defined. The ideas defined by the City need to be organized so that they can be easily incorporated into the FEIS document. The City needs to work closely with the MPO to clarify the details of these mitigation measures. Completing the FEIS is just the beginning of the project. The City will need to remain actively involved during design and construction, when the mitigation measures are implemented.

APPENDIX A
Summary - May 28, 2003 Workshop

EVALUATION OF RAPID TRANSIT OPTIONS
CITY OF MIAMI BEACH

Date: May 28, 2003

Event: Workshop

Location: Community Room, Miami Beach Police Station, 1100 Washington Avenue, Miami Beach

Time: 6:00 p.m. – 8:30 p.m.

Attendees: 38 citizens
Mayor David Dermer, City of Miami Beach
Commissioner Richard Steinberg, City of Miami Beach
Commissioner Matti Herrera Bower, City of Miami Beach
Jorge Gonzalez, City of Miami Beach
Fred Beckmann, City of Miami Beach
Amelia Johnson, City of Miami Beach
Charlie Hales, HDR Engineering, Inc.
Will Suero, HDR Engineering, Inc.
Sorin Garber, HDR Engineering, Inc.
Ignacio Correa-Ortiz, HDR Engineering, Inc.
Laura Turner, HDR Engineering, Inc.

Prepared by: Laura Turner **Date:** June 18, 2003

As each individual signed in, they were provided with a comment form and an agenda. The workshop generally followed the agenda format. Project information was displayed for informal review, which included: four rapid transit technologies (trolley bus, light rail transit, bus rapid transit, and streetcar), three light rail alternatives proposed for Miami Beach from the Draft Environmental Impact Statement, Street Typology Analysis, Existing Population Densities for Miami Beach, and Existing Land Use Zoning for Miami Beach.

Introductions and Presentation

Fred Beckmann, Public Works Director for the City of Miami Beach, welcomed the group to the workshop. The purpose of this workshop was to share ideas about rapid transit options for Miami Beach and to identify what is best of the City. The City has hired HDR Engineering to evaluate the transit options for the City. Mr. Beckmann turned the meeting over to Charlie Hales, the consultant Project Manager.

Introductions and Presentation (continued)

Mr. Hales also welcomed the group to the workshop, introducing elected officials and the study team. He provided an overview of recent events leading to this study. The study team will be looking at four modes of rapid transit – trolley bus, light rail transit, bus rapid transit, and streetcar. Mr. Hales encouraged the group to share thoughts and ideas. This input will be fed into the evaluation process. One more workshop will be held before final recommendations are presented to the City Commission on July 10.

General Question & Answer Session

Before breaking up into five working groups, a question and answer session was held regarding general transit issues. Each question is provided, followed by the response (shown in italics).

- What is the title of the study? *Evaluation of Rapid Transit Options for Miami Beach*

- Will options be considered for the entire City or just South Beach? *Initially, South Beach will be the focus; however, the study team will examine how the system can be extended to other parts of the City*

- Will the "No Build" option be studied? *The "No Build" option was studied in the Draft Environmental Impact Statement (or DEIS) for the light rail option. Since it's already been covered, the "No Build" option will not be included. However, bus service options include little or no new construction and that option will be considered.*

- Will this evaluation cover need? *No*

- Will this evaluation look at options in Miami? *No; the focus will be Miami Beach, east of 5th Street and the MacArthur Causeway*

- In Philadelphia, there have been problems with the track system, involving frequent accidents. Is that the case here? *For more modern rail systems, it is uncommon to have those types of interruptions*

- Concern was expressed about the pitfalls of transit, especially with the congested and narrow streets found in Miami Beach. *This setting will be considered as the four transit modes are studied*

- Need to focus on the pluses and minuses of the different systems so the citizens have a better understanding. *This review is part of the study*

General Question and Answer Session (continued)

- Do Bus Rapid Transit systems have overhead wires? *Some do; some systems are powered by diesel and some systems are operated by a combination of electricity and diesel*

- How will the buses connect to the transit system? *This connection will be determined during the study*

- Need to consider a "sleek" look for the buses serving Miami-Miami Beach routes as a way to identify with Miami Beach. *Comment noted*

- What changes are occurring with federal funding? Do we know what will happen with the new authorization bill? *No; the reauthorization is still under discussion and review; at this point any statements would be speculation; however, these activities will be monitored throughout the study*

- When looking at costs, need to compare apples to apples. *This comparison will be part of the study*

- Need to consider transit for the entire City and not just South Beach. Also, need to be aware of the anticipated and substantial infill development and densities; also look at the influences of North Beach, Sunny Isles, and Surfside. Gridlock has become common, especially during special events. Need to address the residents' needs to move through Miami Beach rather than helping Miami develop. *Comments noted*

- Need to understand that trips are more than vehicles; they involve: rollerblading, skateboarding, walking, and bicycling. Keep in mind the unique character of this community, similar to Provincetown, Cape Cod, and Key West. *Acknowledged that Miami Beach, unlike many other American cities, is walkable and unique*

- Consider dedicated lanes for special events. *This option will be considered during the study*

Tables of Working Groups

After the question and answer session, the audience broke up into five working groups. At each table, there was a facilitator (member of the study team), a Miami Beach map, and markers. Each group had 45 minutes to discuss issues and concerns about mobility issues in Miami Beach. At the end, a representative from each table provided a summary of the discussion. A summary of those thoughts is provided here. At the next workshop, it will be demonstrated how these comments were used in developing recommendations.

Table 1 (facilitated by Laura Turner)

- Did not like the existing bus service for Miami Beach.
- Future transit service, whether bus or rail service, needs to be: reliable with frequent service (every 10 – 15 minutes); quiet; pollution-free; have shelters from the elements (rain and heat); consider size and scale; improved signage; and consider serving the low density/single family home areas.
- The group would like to see: transit service for the entire City eventually; connections at all three causeways to the mainland; accommodation of rollerbladers and cyclists; and more information on transit types.

Table 2 (facilitated by Will Suero)

- Five individuals support rail and one opposes rail, preferring bus service.
- Concerns were expressed about: construction disruptions for rail; reliability; need to incorporate Dade Boulevard; need to serve community gathering spots (Museum, public library at 22nd Street, high school, and supermarkets); incorporate cyclists and rollerbladers on the street; needs to be safe and comfortable; and needs to be easy to use.
- If one doesn't use the bus, there is will be an inclination to use the train.
- The condo communities located north of 17th Street will be concerned if the train system goes through this area.
- Need to connect Miami Beach to the rest of the Region, including at 41st Street and 79th Street.
- Be aware of hurricane evacuation routes, including 79th Street.
- Transit needs to be secure, create a sense of safety.
- Rail service needs to include the whole loop (Alton Road to Convention Center to Washington Avenue to 1st Street).
- Electro-Wave is not popular due to regular breakdowns and unreliable service.
- Consider making rail cars easier (and quickly) accessible for the handicapped.

Table 3 (facilitated by Charlie Hales)

- Gridlock exists on MacArthur Causeway.
- Existing buses are not reliable.
- Try a dedicated land for buses and see if ridership will increase, at least on a trial basis.
- Need to tie in North Beach area to the South Beach area.
- Needs to be quicker than a car.
- If there's monorail, which would be elevated, there are concerns about impacts to the historic area.
- Stops need to be closer together, along with more frequent service.
- Need connections to the Airport.
- Needs to fit in regionally.
- Like the streetcar –quicker construction time; double ended (can go in both directions), flexible (can travel with traffic like in Washington Avenue or be separate), and top speed is 45 miles per hour.
- Consider service for West Avenue in addition to Alton Road.

Table 4 (facilitated by Ignacio Correa-Ortiz)

- Group is split – three want rail and three don't want rail.
- Transit needs to serve the entire City to improve mobility.
- Need to improve east-west connections along the causeways, except the Venetian Causeway. East-West movement needs to be more frequent than other routes.
- Consider dedicated lanes for certain hours rather 24 hours. Suggested areas are: Collins Avenue, Washington Avenue, Alton Road, 5th Street, MacArthur Causeway, and Tuttle Causeway.
- Make the buses look like streetcars, like in Coral Gables and West Palm Beach.
- Use Watson Island for park and rider.
- Need priority routes for bicyclists.
- Create disincentives to bring cars on Miami Beach from the mainland.

Table 5 (facilitated by Sorin Garber)

- Route B-2 is needed for commuter and local circulator service.
- There is discretionary behavior in trip making; frequent service is good.
- Need a citywide solution.
- Two systems need to be developed: (1) local circulation along Alton Road to Washington Avenue to 15th/17th Streets to 1st Street; and (2) commuter service to the Convention Center, continuing to North Beach (potentially switching to Bus Rapid Transit north of the Convention Center).
- Interest among the group in transit; may consider bus over rail.
- Concern over Miami's interest in adding people mover stations.

Table 5 (facilitated by Sorin Garber)

- Congestion will still remain.
- Want to know if rail will actually be used.
- Want to know who will use rail and the frequency of service.
- Need to consider the short term and long-term needs of North Beach.
- Want to know if this system is necessary for South Beach. If so, need to also address the needs of the rest of the City.
- Concerned about cost effectiveness.

General Comments Shared by the Entire Group

After these table presentations, the entire group was invited to share any other thoughts or comments. Charlie Hales facilitated this activity.

- Need to connect to the Airport and the Miami Intermodal Center.
- Need to learn more about the Federal Transit Administration (FTA) funding process, especially the timing of the route and mode.
- Need to answer can rapid transit be embraced and not be rail.
- Miami Beach's role, within the Region, is to look at alternatives.
- Need to look at how the results of this study can be used.
- A lot of traffic is "passing through" Miami Beach, from the communities to the north; therefore, there is a need to improve the east/west connections to the mainland.
- Need to determine the kind of system for Miami Beach.
- It is time for vision.
- Need to understand the real deadlines for making decisions.
- Need to be connected (locally and regionally).
- Need to review the Downtown Miami Transportation Plan adopted the previous week.

Written Comments Submitted

Comment forms were provided to those in attendance. If there were thoughts to be shared with the study team, they could be submitted at the workshop, or returned to Mr. Hales, postmarked no later than June 6, 2003. Twelve comment forms were submitted at the workshop. The number in parenthesis indicates how often the comment was made.

Support of Rail Options

- Supports light rail (5) – one comment expanded support since LRT does not pollute; quiet; and provides sense of permanence, adventure, and safety; supports B-2 option – light rail or streetcar, as single track and bi-directional
- Need an honest evaluation of bringing existing heavy rail people mover to Miami Beach by a tunneled guideway (1)
- Need central people mover from Miami to Miami Beach, with stations at: 1st Street, 5th Street, 10th Street, 15th Street, 17th Street, 21st Street, 41st Street, 69th Street, 72nd Street, 85th Street, and 95th Street; results in no disruption to parking or businesses; provides shade; ride is a tourist attraction; buses need for east-west service; parking on Watson island (1)

Against Rail Options

- No one wants a gravy train for politicians, don't want the streets torn up, don't want criminals on the train (1)

Considerations During Study

- Need to understand the role of concurrency, Level of Service, zoning codes, growth management, and accumulated effects of north-south traffic (1)
- Have next workshop in the "Mid Beach" area to reach other groups in the City (1)
- Recommends a televised workshop before the City Commission's Public Hearing (1)
- Service needs to be provided from Alton Road to Washington Avenue and from 1st Street to 17th Street (1)
- Need to include restrictions, or taxes, o non-residential auto traffic if don't take rapid transit to Miami Beach to succeed (1)
- Need to dispense the clogged traffic corridors via bus system and cars with connections across the three causeways (1)
- Need to accommodate all modes – bicycles, scooters, skaters, skateboarders, and pedestrians (1)
- Need to include/consider the recently adopted Downtown Miami Transportation Plan (1)

Detailed Information Needed for Study

- Would like real data regarding the number of individuals using a South Beach to Downtown Miami connection every day (1)
- Need information regarding: most heavily used Miami Beach routes and stops; and traffic origin and destination information (1)

General Comments

- Nobody, if given the choice, rides the bus (1)
- Let go of tradition and embrace vision (1)
- Non-dedicated lanes will not work (1)
- Nice forum (1)
- Buses are ok since flexible in service provided – able to add or cutback at any time (1)
- Something efficient is needed, especially serving the east/west connections (1)
- Against City of Miami's shift to elevated "people mover" (1)

APPENDIX B
Summary - June 9, 2003 Workshop with Miami Beach City Commission

HDR | ONE COMPANY *Many Solutions*℠

Memo

To: Jorge Gonzalez, City Manager – City of Miami Beach	
From: Charlie Hales, HDR	Project: Evaluation of Rapid Transit Options
CC: Fred Beckmann	
Date: June 10, 2003	Job No: 00000000000-3869

RE: Notes from June 9, 2003 Commission Workshop, Including Identification of Requests for Out-of-Scope Efforts

Dear Mr. Gonzalez:

I've attached here a summary of the comments and responses our team recorded at yesterday's Commission Workshop for your use. As you requested, I'm highlighting here those requests that were made by Commissioners and the Mayor that may represent work that has not been included in our scope of work.

These requests are:

- Request that HDR complete an origin and destination study to support need for project (by MB).
- Request to provide comparisons of ridership and cost characteristics or LRT, BRT and Streetcars (by RS).
- Request to provide examples of where LRT systems did not remove travel lanes (SG).
- Concern about the impact of hurricanes on catenary lines (RS)
- Request to provide analysis of safety records and aspects of LRT and BRT systems (JS).

In each case, we have offered a recommendation about whether or not this item should be added to the Phase I scope, whether it should be considered as a Phase II item, etc.

I look forward to reviewing the above with you

Sincerely,

Charlie Hales, Project Manager

Initial Questions and Remarks from Commissioners:

1. (LG) Why wasn't West Avenue considered for N/S routing?	West Avenue was evaluated. See Table 1
2. (SG) Team should 'catalog your impressions about (the four modes) and how they could work with our unique streets'. You need to analyze the modes in the vein of what makes sense for Miami Beach.	Section 3.3 of this Evaluation analyzes the mode options against Miami Beach's streets.
3. (SG) Current ridership numbers don't seem to meet acceptable cost/new rider measures. Do we have a proposal that FTA will rank highly?	The proposed project appears to be a strong candidate for FTA approval and funding on all of the FTA criteria…ridership, cost-effectiveness, finance and land use in particular.
4. (MB) Did the DEIS examine the origins and destinations of riders?	We have learned that it did not, and we believe that this kind of analysis should be done. Not part of scope, but possible Phase II task.
5. (SG) Don't believe that the higher speeds associated with rail transit and fixed guideway systems is an important issue in urban environments. Can you describe why the capacity offered by these systems is a benefit to us? LRT's capacity is a more relevant benefit in larger urban settings with large event facilities, such as stadiums.	This Evaluation makes recommendations about the capacity and scale of the project in order to "right size it" to Miami Beach conditions.
6. (SG) Can we quantify the difference in operating costs between modes?	This Evaluation provides these comparisons.
7. (JS) With the new BRT vehicle types, it doesn't appear that there's much difference in the aesthetics between BRT and LRT vehicles. When communities have had to make the choice between BRT and LRT, what have been the contributing factors in their decisions?	There are few examples of where BRT has been implemented, and therefore, chosen over LRT; however, cost is usually the determining factor.
8. (RS) Can you provide comparisons of the ridership and cost characteristics of BRT, LRT and Streetcars?	We have provided some of this comparative information , however, there are so few examples of BRT and streetcar implementation. Pittsburgh provides the only real good example of BRT in an urban setting, and Streetcars are limited to Portland, Tampa and Tacoma.
9. (SC) LRT and Streetcar modes appear to be better for circulation, while BRT may be better for longer commuter trips. Is this correct?	The classic use of BRT is for suburban to urban origin-destination patterns. We believe Miami Beach needs a transit system that provides for local circulation, short trips, and expansion to the north.
10. (MB) What would happen to our current MDTA and Electrowave services if LRT and/or BRT were built.	Continuation of Electrowave service in South Beach would not be needed if the recommended project were built. Enhanced service in other parts of the City is an option.
11. (JS) What would be the significance to Miami Beach if our proposed LPA were	Ultimately, the Miami-Dade MPO must approve an LPA for the overall project. If these

different than Miami's proposed LPA?	recommendations are approved by the Miami Beach City Commission, the City of Miami could be asked to review their LPA recommendation and consider revisions, if needed.
12. (MB) Will the LPA contain vehicle specifications; and what if our specifications differed from those proposed by Miami?	See Question 11 above.
13. (JG) Do you have any initial thoughts about extending transit services north of 17th Street?	Collins/Indian Creek, Collins in its two-way sections and Collins/Harding appears to be a good transit couplet as long as there's no travel lane loss.
14. (SG) Can you provide examples of where LRT systems did not remove travel lanes?	Generally, LRT projects do remove travel lanes.
15. (RS) Make sure the Final Report includes the No Build option.	The final report will review the consequences of a No Build option.
16. (SG) Provide examples of where and how landscaping has been incorporated into LRT projects.	Portland, San Diego, St. Louis and the project now under design in Phoenix have made significant use of landscaping in project design
17. (RS) Concern about the impact of hurricanes on catenary lines. Can you provide examples of where that's been considered?	Tampa is a recent example of an operating line in an area subject to hurricanes. The system now being designed in Houston will also have this requirement. Older systems in these conditions include New Orleans and Galveston.

Questions and Remarks from General Public:

1. (Joe Fontana) Why are we meeting at the Convention Center and not City Hall as we normally do?	
2. (Joe Fontana) We are a unique city. Why show us streets and transit systems from other cities?	
3. (Frank Del Vecchio) The project will not decrease congestion as stated in the DEIS.	
4. (Frank Del Vecchio) Only the MPO has the authority to advance the LPA.	
5. (Fran k Del Vecchio) A fatal flaw of each of the LRT and BRT alternatives is that they each remove a parking lane or a travel lane on Washington and Alton.	
6. (Frank Del Vecchio) Take Collins/Indian Creek "off the table".	
7. (Frank Del Vecchio) A minimal increase in transit usage will not decrease our congestion levels. We should eliminate any option that removes travel and parking lanes. We should only advance the No Build option.	
8. (Beverly Heller) How will these transit alternatives impact public schools; e.g., with regard to pedestrian safety?	
9. (Beverly Heller) Believes that jitney services, like those once used in Atlantic City, are a reasonable and good option for Miami Beach	
10. (James Cucciara) Believes we need to consider using the beach for both transit and auto use – believes there's adequate room to do so.	
11. (James Cucciara) If we do select a rail transit option, believes it ought to be a double-track alignment.	Portions of the recommended alignment are double-tracked.
12. (James Guiterrez) Would like to see transit between Dune and Lummus Park.	
13. (Phillip Cousins) We need to consider hurricane evacuation and safety from downed catenary lines.	(SC) Why can't we turn off power to overhead electrical systems in case of hurricanes? This can be done
14. (Phillip Cousins) Major concern is with construction disruption and impacts to businesses.	Reducing construction impact is a criterion used in developing this Evaluation's recommendations.
15. (Phillip Cousins) Need to consider economic impact of not keeping visitors on Miami Beach after a convention.	(SC) Believes that rail transit will actually benefit Convention Center because it would extend the number of hotels that conventioneers would find to be in acceptable proximity to the facility. (MB) Could the consultant team tell us how many hotel rooms could be helped by the transit alternatives in Miami Beach and in Miami? Ridership modeling does take hotel visitation into account.

16. (Bruce Reich) Believes that citizens are against rail transit alternatives because they don't understand the benefits, but can see the impacts such as loss of parking, and additional traffic congestion.	
17. (Bruce Reich) Could the MPO produce a LPA that simply improves bus service in Miami Beach?	(Mayor Dermer) Could we get FTA funds for a two-mode transit system? Very unlikely, given the criteria applied to rate proposed projects.
18. (Benita Argos) Need to verify whether the system would shut down in a 55 mph hurricane.	The electrical system could (and should) be designed in this way.
19. (Benita Argos) Thinks our photos of transit vehicles need to include cars in traffic lanes.	Photosimulations in this report depict vehicles in the travel lanes.
20. (Benita Argos) Believes that West Avenue is extremely congested and could not accommodate transit. "We like West Avenue the way it is."	
21. (Mike Burke) Need to provide empirical evidence that transit will ameliorate traffic congestion.	There is little data on congestion reduction, but there is evidence demonstrating that transit can reduce future traffic congestion levels.
22. (Mike Burke) We need an economic impact analysis of the project.	
23. (Mike Burke) We also need a safety evaluation of the conflicts between rail systems and pedestrians.	
24. (Mike Burke) Recommends the No Build option.	
25. (Richard Schootz) There's been little discussion about tourists, and how they may benefit from transit.	Attracting choice riders, tourists among them, is a criterion used in evaluating options
26. (Richard Schootz) Need to consider the impact of the project on Watson Island as well as OMNI/downtown.	A Watson Island station stop is assumed in this Evaluation.
27. (Miami Planning Board and UM Architecture School) – Are there any streetcar projects in the current New Starts applications?	Yes.
28. (Miami Planning Board and UM Architecture School) – Why didn't Portland use federal funds for their streetcar?	To save time.
29. (Miami Planning Board and UM Architecture School) – Believes the consultant study needs to stress and demonstrate how the system will benefit Miami Beach. The presentation today did not accomplish that. The next presentation ought to be less technical; and more community oriented.	
30. (Jerry Pilnholf), markets the Miami Beach Novel Hotel) Miami Beach needs to become a "more glamorous", yet "laid-back", place. Would rather see a transit system that stops only at the airport, Biscayne Blvd, I-95, and the Miami Beach Convention Center. Transit riders could then transfer to taxis to arrive at hotels.	

31. (Dan Outerbridge, representing the Flamingo Park neighborhood) Can construction impacts be mitigated? Will there be an upgrade to utilities and overhead facilities with tearing up the streets?	(SC and JG) HDR's report needs to document water and sewer construction projects ($400 million project going out to bid shortly) that may have to be concurrent with a rail transit or BRT project construction. The City's Capital Improvements plan should be revised to reflect the transit project's location and schedule.
32. (Robert Warren) What is the true cost/rider and do we have credibility with the FTA with such low DEIS ridership forecasts?	Have addressed FTA requirements in our report, but will not perform a formal transportation system user benefit calculation/analysis.
33. (Jeanette Martinez, represents the Court of South Beach) When will the route be decided?	(Mayor Dermer) Route and mode selection will be the result of this study and the Commission's decision on its findings.
34. (Jeffrey Bradley, Alliance for Reliable Transit) Can LRT and the water and sewer systems be built concurrently?	Yes.
35. (Milt Montalvo) Are we planning on completing an Air Quality impact study?	(An Air Quality analysis was completed as part of the DEIS.
36. (Erika Brophy) Will a route be selected in Phase I	Yes.
37. (Erika Brophy) Would like to see West Avenue examined.	Done.
38. (Mark Needle, representing Flamingo Park neighborhood and PROTRANSIT.ORG) Would like to have team examine a streetcar circulator in South Beach with a BRT service to North Miami Beach.	Circulation needs are one of the criteria used to develop the recommended alignment.
39. (Dave Bartlett, from South Miami) Would like the study to re-examine what the best connections between Miami Beach and the region are. Personally would like to see extension of MetroRail to Miami Beach.	Given Miami's adoption of LRT as their LPA mode, would recommend completing Phase I before re-examining other modes.
40. (Mike Robinson, PROTRANSIT.ORG) Requests that an economic impact study be included in the analysis, and that it's time frame include 3, 5, 10, 20, 30 and 50-year scenarios.	

Miscellaneous Questions and Remarks from Commissioners during General Public Responses:

1. (SC) Doesn't want to see any change to the median in Washington Avenue	The recommended design retains the median.
2. (JC) Would like to see the safety records and safety aspects of LRT and BRT systems evaluated.	Not part of scope, but could be added as a Phase I task or Phase II task.
3. (Mayor Dermer) How much time passes between the adoption of the LPA and construction of the system?	Typically, this period takes about 36 months.
4. (Mayor Dermer) We were told by Electro-Wave staff that it would take about 9 years to build the system after the LPA was approved. Who's right here? Can you clear this up for us?	Depending on the MPO's timetable for completion of the FEIS and subsequent stages, and depending on federal decisions, the project could be in construction within three years and open for revenue service in two more.
5. (SG) Can we have a 7/10/03 meeting for HDR to make a presentation of findings?	Meeting scheduled.

APPENDIX C
Summary - June 25, 2003 Workshop

EVALUATION OF RAPID TRANSIT OPTIONS
CITY OF MIAMI BEACH

Date: June 25, 2003

Event: Workshop

Location: Eden Roc Hotel, Mona Lisa Room, 4525 Collins Avenue, Miami Beach

Time: 6:00 p.m. – 9:00 p.m.

Attendees: 50 citizens
Commissioner Richard Steinberg, City of Miami Beach
Commissioner Matti Herrera Bower, City of Miami Beach
Commissioner Luis Garcia, City of Miami Beach
Commissioner Jose Smith, City of Miami Beach
Robert Middaugh, City of Miami Beach
Fred Beckmann, City of Miami Beach
Amelia Johnson, City of Miami Beach
Charlie Hales, HDR Engineering, Inc.
Will Suero, HDR Engineering, Inc.
Sorin Garber, HDR Engineering, Inc.
Ignacio Correa-Ortiz, HDR Engineering, Inc.
Laura Turner, HDR Engineering, Inc.

Prepared by: Laura Turner **Date:** July 3, 2003

Introductions and Presentation

Robert Middaugh, Assistant City Manager for the City of Miami Beach, welcomed the group to the workshop. The purpose of this workshop was to provide an update on the activities since the May 28 workshop and for citizens to share ideas. Mr. Middaugh turned the meeting over to Charlie Hales, the consultant Project Manager.

Mr. Hales also welcomed the group to the workshop, introducing elected officials and the study team. Sorin Garber provided a demographic profile of Miami Beach as well as traffic features. Ignacio Correa-Ortiz described how to address future growth by outlining the issues that influence growth and development. Mr. Hales closed the presentation with a review of the four rapid transit technologies studied (light rail, bus rapid transit, trolleybus, and streetcar).

General Question & Answer Session

A question and answer session followed the project presentation. Each question is provided, followed by the response (shown in italics).

- Concerned expressed about the overhead wires falling down during hurricanes. *The transit system will be designed to address those conditions*

- Will the transit be mixed with other activity? If so, concern expressed about rollerblades and bicycle tires getting caught in the tracks. *The project could be designed to minimize those conflicts, along with an overall awareness program*

- How do you recommend transit for a city like Miami Beach, which is much smaller than other cities with rail? *Other communities, such as Winston-Salem, North Carolina, are looking at the streetcar. Permanent population is only one factor to consider; also need to consider serving the large number of visitors to the City*

- Why have overhead wires; they take away from the beauty of Miami Beach? *By being powered by overhead wires, the train can be placed in any location within the street; the wires tend to blend with the canopy of trees and the horizontal lines of buildings*

- ART (Alliance for Reliable Transport) endorses the streetcar; this will beatify the neighborhood if done right. *Comment noted*

- If we build a transit system, will they come? *In every city with light rail or streetcar, ridership exceeded projections*

- Is there a similar beach community to Miami Beach which has transit? *Yes, San Diego*

- Need to connect to the whole Region, not just within Miami Beach; streetcars do not pollute; streetcars will replace the need for taxis. *Comments noted*

- Need to consider that Miami Beach has a different peak hour than standard peak hours. *Comment noted*

- Where will the transit take me? Who is it good for? *In Portland, the transit system was initially serving commuters, from the suburbs into downtown; as more urban housing became available, the commuting flow reversed; actually the busiest day is Saturday with non-work related trips*

General Question and Answer Session (continued)

- Will transit reduce the flow of cars? *There will be some reduction*
- Rail would be negative for our community. *Comment noted*
- Trolleybus term is confusing. *This term will be clarified*
- Need to minimize the discomfort of the rail; concerned about the tracks being dangerous, especially if people will slip on the tracks? *Comment noted; issues can be addressed during design*
- Want the system to be attractive to fit in with the City. *Comment noted*
- Which mode is most reliable? *Either of the rail options*

Working Table

After the question and answer session, the audience had the opportunity to identify potential routes for transit. At least one route needs to connect: the high school, Publix, Convention Center, the library, and the Bass Museum. In addition to Electrowave connecting Mt. Sinai Hospital to Collins Avenue, it also needs to provide service into Mid Beach.

Written Comments Submitted

Comment forms were available to the participants as they signed in. They could either return completed comment forms at the workshop or by returning them to Mr. Hales, postmarked no later than July 3, 2003. Four comment forms were submitted at the workshop. The number in parenthesis indicates how often the comment was made.

- Request for a copy of the Executive Summary (1)
- Study fails to address specifics of concurrency, capacity, ease of adapting to east-west travel patterns (1)
- Need to consider the uniqueness of Miami Beach (1)
- Alliance for Reliable Transport (ART) supports the streetcar option as described in a submitted copy of a press release (1)
- Uses the bus; trip could have been more comfortable (1)